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**Savings and Loan Associations:
An Analysis of the Recent Decline
in Profitability**

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Savings and Loan Associations: An Analysis of the Recent Decline in Profitability

By Daniel J. Vrabac

Over the past two years, the savings and loan industry has fought a losing battle with high and volatile interest rates and increased competition for deposits. In the process, the industry registered losses of over \$4.6 billion in 1981—more than 14 percent of the previous year's net worth.¹ As a result, many savings and loan associations have had to merge with another institution or seek other types of aid from federal insurance corporations.

This article examines the factors behind the sudden and rapid decline in the profitability of the savings and loan industry. The article begins with an overview of the industry in terms of its function, structure, and legal and regulatory environment. The second section analyzes the asset and liability factors that have contributed to the losses experienced by savings and loans in recent years. The final section

reviews the problems of the industry and discusses some alternatives for improvement in the profit picture.

THE SAVINGS AND LOAN INDUSTRY

Savings and loan associations as a group constitute one of the nation's most important depository institutions. As such, they help channel the nation's savings into productive investment by accepting deposits from savers and making credit available to investors. For the most part, S&L deposits are obtained from individuals, while credit extensions take the form of mortgages on private residences. S&L's are the nation's major providers of residential mortgage funds: at the end of 1981, they held 53 percent of the nation's outstanding private residential mortgage credit.²

Industry Structure

At the end of 1981, there were 3,779 federally insured S&L's with \$651 billion of assets. Most of these S&L's are small, as indicated by the fact that those with \$50 million or less in assets constitute 45 percent of all S&L's but hold only

¹ This article deals only with those associations whose deposits are insured by the Federal Savings and Loan Insurance Corporation (FSLIC). FSLIC associations accounted for more than 98 percent of all S&L assets at the end of 1980.

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² Data and descriptions in this section were obtained primarily from the *1981 Savings and Loan Sourcebook*, published by the U.S. League of Savings and Loan Associations, and the Federal Home Loan Bank Board *Journal*, various issues.

Table 1
SIZE DISTRIBUTION OF INSURED SAVINGS AND LOAN ASSOCIATIONS
1981

Asset Size (Millions of Dollars)	Number	Percent of Total	Total Assets (Billions of Dollars)	Percent of Total
Under 10	305	8	1.8	—
10 to 25	635	17	11.0	2
25 to 50	757	20	27.7	4
50 to 100	820	22	59.0	9
100 to 250	740	19	115.6	18
Over 250	529	14	435.9	67
All savings and loan associations	3,779	100	651.0	100

SOURCE: Federal Home Loan Bank Board.

6 percent of industry assets. Conversely, associations with \$250 million or more in assets constitute only 14 percent of all S&L's but hold 67 percent of industry assets (Table 1).

S&L's have two distinct forms of ownership. One is the mutual organization in which depositors are owners and are entitled to vote on association affairs. Mutuals represented 79 percent of all S&L's and held 71 percent of S&L assets at the end of 1981. The other form of ownership is the stock organization, which issues shares of capital stock that can be bought and sold in the marketplace. Shareholders have voting rights and may also receive dividends. At the end of 1981, stock associations accounted for 21 percent of all S&L's and held 29 percent of all assets. The stock form of organization was limited to state-chartered associations until late 1973 when the Federal Home Loan Bank Board (FHLBB) began authorizing conversion of federally chartered mutual S&L's to stock form.³

Legal and Regulatory Environment

Savings and loan associations may be chartered on either the federal or the state level.

Federally chartered S&L's are regulated by the Federal Home Loan Bank System and, to a lesser extent, by the Federal Reserve System under the Monetary Control Act of 1980. All federally chartered associations are required by law to have their savings deposits insured by the Federal Savings and Loan Insurance Corporation (FSLIC)—the savings and loan industry counterpart to the banking system's Federal Deposit Insurance Corporation (FDIC). State-chartered associations are monitored by the respective state banking or savings and loan regulatory department. Most state-chartered associations are insured by the FSLIC, although insurance is not legally required.

The legal and regulatory environment has helped the savings and loan industry become the nation's predominant private mortgage

³ In addition, the FHLBB recently approved several amendments to its conversion rule that make it easier and less costly for S&L's to switch to stock form, e.g., increasing the maximum percentage of stock which could be held by an individual, and increasing the time period from 45 days to two years in which an S&L must begin its stock subscription offering once a conversion is approved. See Lisa J. McCue, "S&L's Get Help on Switching to Stock Form," *American Banker*, April 29, 1982.

lender. This has been accomplished in part by providing S&L's a tax incentive for investing in mortgage loans.⁴ In order to obtain tax reductions, though, S&L's must maintain a very high proportion of total assets in mortgages. The funds for mortgage lending come from deposit accounts on which S&L's are allowed in some cases to pay higher rates than competing "full service" depository institutions.⁵ The rates paid on deposits—with some exceptions—are subject to ceilings set by federal regulatory authorities.⁶

Since 1980, S&L's have been placed under the regulatory arm of the Depository Institutions Deregulation Committee (DIDC) set up by the Monetary Control Act. The DIDC is responsible for determining what ceiling rates can be paid on the various types of deposit accounts.⁷ The Monetary Control Act reduces the tax disincentive for S&L's to hold non-mortgage assets and permits the nationwide use of NOW accounts. S&L's which do offer NOW accounts or other reservable liabilities are required to hold reserves at a Federal Reserve Bank.

Industry Growth and Change

The S&L industry has grown considerably in the past decade. At the same time, changes have

⁴ For a discussion of the evolution of the tax incentive to invest in mortgages, see Kenneth R. Biederman and John A. Tuccillo, *Taxation and Regulation of the Savings and Loan Industry*, Lexington, Mass.: D.C. Heath and Co., 1976, pp. 5-8.

⁵ The rationale behind the necessity of the savings and loan differential is explained in Biederman and Tuccillo, pp. 49-51.

⁶ The exceptions are large certificates of deposit, 18-month or longer IRA's, and the new 3½-year or longer ceiling free deposits.

⁷ Although a differential exists on the rates paid on certain deposits by S&L's, the DIDC, under the authority of the Monetary Control Act, has established a schedule of interest ceilings on all time and savings accounts that applies to all depository institutions and will gradually be phased out by 1986.

occurred in the composition of S&L assets and liabilities. Total assets increased over the past 10 years at an annual rate of 12.6 percent, as assets rose from \$200 billion at the end of 1971 to \$651 billion at the end of 1981 (Chart 1). During the same period, mortgage loans and securities backed by mortgages increased at an annual rate of 12.4 percent, and savings deposits rose at a rate of 11.9 percent. Total assets and mortgage loans and securities, as well as total deposits, rose less rapidly in the last half of the 1970s than in the first half.

The relative importance in S&L asset portfolios of mortgage-related loans and securities has declined in recent years, although the great majority of S&L assets continues to consist of mortgage-related assets. Mortgages and securities backed by mortgages accounted for 83 percent of total S&L assets at the end of 1981, compared with 85 percent in 1971 (Table 2). S&L holdings of mortgage-backed securities have grown rapidly, increasing as a percentage of total assets from less than 1 percent in 1971 to 5 percent in 1981. The importance of other loans, mainly consumer loans, has also increased and in 1981 accounted for 2.8 percent of the total, compared with 1.4 percent in 1971.

On the liability side, deposits make up by far the largest portion, although the relative importance of deposits has declined in recent years. Deposits accounted for 79 percent of total liabilities and net worth in 1981, down from 85 percent in 1971. Borrowings—mainly from Federal Home Loan Banks—have increased in importance, totaling 13 percent of total liabilities and net worth in 1981, up sharply from 5 percent in 1971. Net worth—equity capital and retained earnings—declined from 6.5 percent of total liabilities and net worth in 1971 to 4.3 percent in 1981; nearly half of that decline was in 1981 alone. Apart from changes in invested capital, changes in net worth reflect changes in after-tax profits. The rapid decline

Table 2
PERCENTAGE DISTRIBUTION OF ASSETS AND LIABILITIES
OF INSURED SAVINGS AND LOAN ASSOCIATIONS

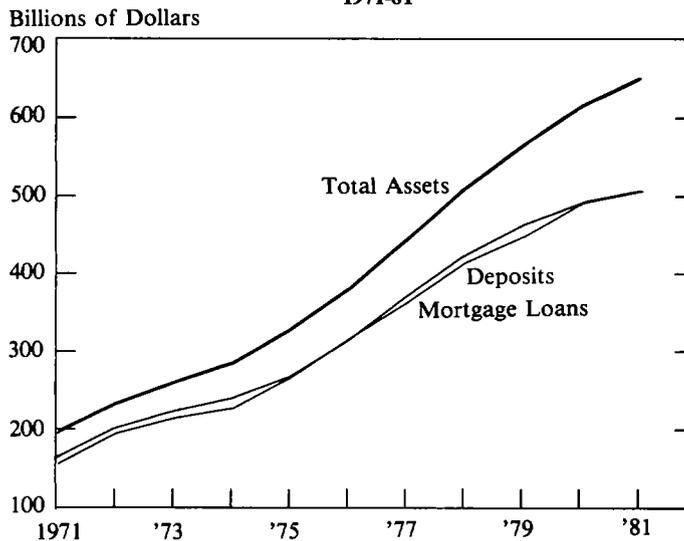
1971, 1976, 1981

	<u>1971</u>	<u>1976</u>	<u>1981</u>
Mortgage Loans	84.9	82.6	78.3
Cash and Investments	10.9	9.8	10.2
Mortgage-Backed Securities	0.0	2.7	5.0
Other Loans	1.4	2.1	2.9
Real Estate Owned	0.4	0.5	0.5
Other Assets	2.4	2.3	3.1
Total Assets	100.0	100.0	100.0
Deposits	84.6	85.6	78.7
Borrowings	4.5	5.0	13.6
Loans in Process	2.5	1.8	1.0
Other Liabilities	1.9	2.0	2.4
Total Liabilities	93.5	94.4	95.7
Net Worth	6.5	5.8	4.3
Total Liabilities and Net Worth	100.0	100.0	100.0
Number of Institutions	4,271	4,044	3,779

SOURCE: Federal Home Loan Bank Board.

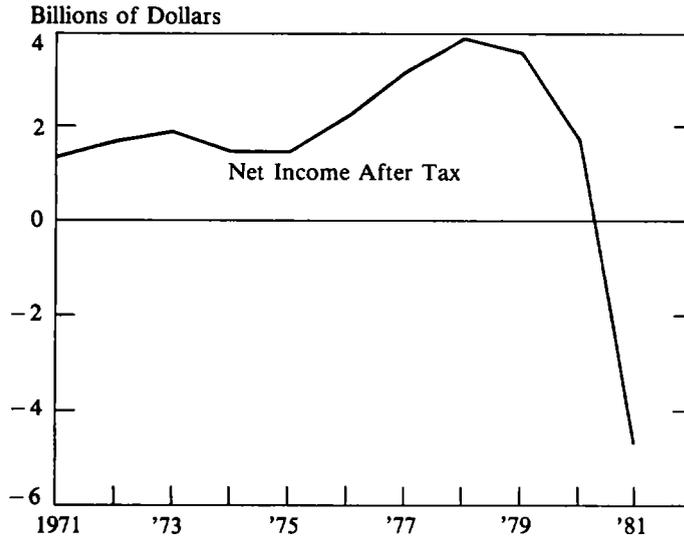
Chart 1
ASSETS, MORTGAGE LOANS, AND DEPOSITS
OF INSURED SAVINGS AND LOAN ASSOCIATIONS

1971-81



SOURCE: Federal Home Loan Bank Board.

Chart 2
AFTER-TAX INCOME OF
INSURED SAVINGS AND LOAN ASSOCIATIONS
1971-81



SOURCE: Federal Home Loan Bank Board.

in S&L profits in the last few years has led to a number of failures and subsequent mergers with other institutions. The number of S&L's declined by 5.1 percent from 1971 to 1978, but fell another 6.6 percent from 1978 to 1981. The interpretation, causes, and implications of the erosion in S&L profits are discussed in the following section.

THE PROFITABILITY OF SAVINGS AND LOAN ASSOCIATIONS

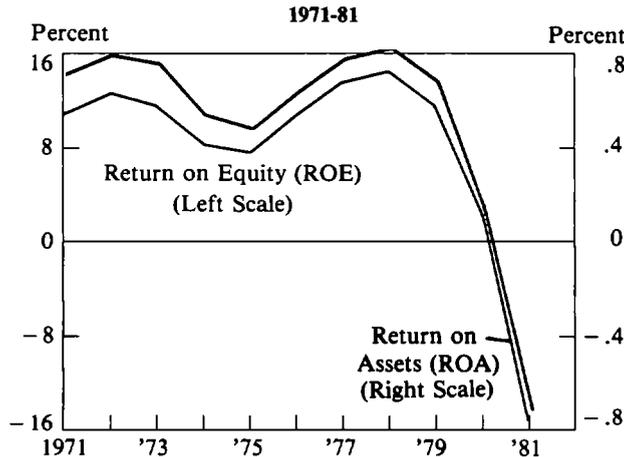
After-tax profits at savings and loan associations rose during most of the 1970s and achieved a record level of \$3.9 billion in 1978. Profits turned sharply downward thereafter—by 1980, profits had fallen below their 1971 level. In 1981, the industry suffered losses of over \$4.6 billion—an amount greater than any prior year's gain (see Chart 2).

In analyzing the profitability of financial institutions, it is useful to focus on profits relative

to equity or assets. Two commonly used measures of profitability are the ratio of after-tax profits to equity—the return on equity, ROE—and the ratio of after-tax profits to total assets—the return on assets, or ROA. Arithmetically, ROA is a determinant of ROE, in that profit per dollar of equity (ROE) equals profit per dollar of assets (ROA) multiplied times assets per dollar of equity, or the leverage ratio.⁸ In practice, ROE and ROA move together, as shown in Chart 3 for the 1971-81 period. The leverage ratio measures the extent that assets are financed by nonequity sources and influences the degree of change in ROE rather than the direction of change. An increase in the leverage ratio enhances ROE when ROA is positive, but has a negative impact on ROE when ROA is negative.

⁸ In other words, $ROE = ROA \times LR = \text{after-tax profits, } P, \text{ divided by total assets, } A, \text{ times total assets divided by}$

Chart 3
RETURN ON ASSETS AND RETURN ON EQUITY
OF INSURED SAVINGS AND LOAN ASSOCIATIONS



SOURCE: Federal Home Loan Bank Board.

NOTE: ROA is equal to net after-tax income divided by average total assets.
 ROE is equal to net after-tax income divided by average equity.
 All averages are 13-month averages, December to December.

The remainder of this section focuses on an analysis during the 1971-81 period of the behavior of ROA. As shown in Chart 3, ROA fluctuated between 0.5 and 0.8 percent during most of the period, but plunged in 1980 and 1981, falling to a negative 0.7 percent by 1981. To facilitate the analysis, ROA is broken down into two ratios: the gross return on assets (the ratio of total revenues to total assets) and the expense ratio (the ratio of total expenses to

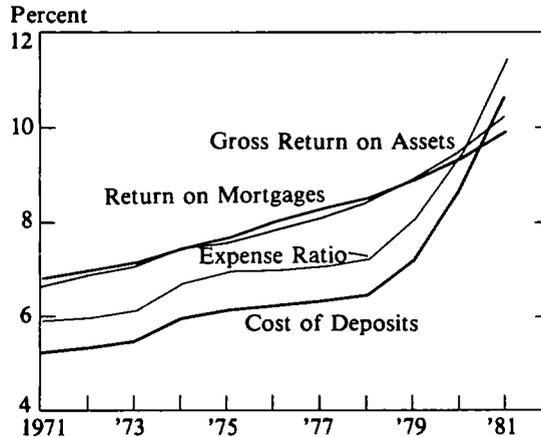
total assets). Arithmetically, ROA is equal to the gross return on assets minus the expense ratio.

Profitability—The Asset Factors

The gross return on assets depends on the return on each type of asset in S&L portfolios and the relative importance of the different types. As pointed out in the previous section, the importance of nonmortgage loans has increased in recent years. Thus, the return on these loans has had an increasingly larger impact on the gross return on assets at S&L's. Also, while the importance of investments has not increased, the return on investments has risen sharply, reflecting the rise in market interest rates. This has enlarged the impact of the investment portfolio on the gross return on assets. Nevertheless, while the impact of both nonmortgage loans and investments has increased, the gross return on assets continues to

equity, E , or $\frac{P}{A} \times \frac{A}{E}$. Some observers believe that there may be difficulty in using the ROE for savings and loan associations due to the predominance of the mutual form of organization. The equity portion of ROE for most businesses includes retained earnings and capital stock that has been previously issued and purchased by investors and that can be traded in the marketplace. The equity, or net worth, in a mutual organization comes solely from earnings retained in the association, because the owners are depositors and not shareholders.

Chart 4
GROSS RETURN ON ASSETS, EXPENSE RATIO, AND RELATED
MEASURES OF INSURED SAVINGS AND LOAN ASSOCIATIONS
1971-81



SOURCE: Federal Home Loan Bank Board.

NOTE: The gross return on assets is the sum of interest earned on mortgages, interest earned on all other earning assets, and noninterest operating income, divided by average total assets.

The return on mortgages is the interest earned on mortgages divided by average mortgages outstanding.

The expense ratio is the sum of the interest cost of deposits, the interest cost of borrowing, and noninterest operating expenses, divided by average total assets.

The cost of deposits is the interest paid on deposits divided by average deposits.

All averages are 13-month averages, December to December.

be dominated by the return on S&L mortgage portfolios (ROM) because of the continued predominance of mortgages in asset portfolios. For this reason, the trend in the gross return on assets follows very closely the trend in ROM (Chart 4).

The ROM during any period depends on the return on older mortgages in the portfolio as well as the return on new mortgages, RNM, closed during the period. ROM depends also on the turnover rate of mortgages, since the lower the turnover of older loans (sales, maturities, and prepayments as a percentage of loans outstanding), the greater the impact of the return on older mortgages and the less the impact of the return on new mortgages.⁹ Because the turnover rate on mortgages is low, ROM is not very responsive, on a year-to-year basis, to

changes in RNM. For example, in 1980, 67 percent of S&L mortgage portfolios had a return of 10 percent or less, compared with a return on new loans of 12.5 percent. In addition, 79 percent of these low-return mortgages had at least 20 years remaining until maturity.¹⁰ Thus,

⁹ The turnover ratio had averaged 14.6 percent of the average mortgage portfolio in the 1971-81 period, reaching a peak in 1977 of 18 percent. Turnover declined thereafter, dropping to 9.4 percent in 1981.

¹⁰ Although the term to maturity on these mortgages is 20 years or longer, mortgages on average remain on the books a much shorter time because of prepayments and sales. However, during periods of rising interest rates, early principal repayments decline, and the average length of time that outstanding mortgages remain on the books increases. From the *Report of the Task Force on Savings and Loan Portfolio Profitability*, July 1981, Table II-1, a report prepared for the Board of Directors of the Federal Home Loan Bank of Little Rock and the Federal Home Loan Bank Board.

short-run movements in ROM depend mainly on the return on old mortgages.

The low turnover rate on mortgages reflects the long maturity and fixed-rate features of mortgage loan contracts. Although variable-rate and variable-term mortgages constitute nearly half of newly issued mortgage loans, they have not yet become a significant part of S&L mortgage portfolios. As a result, fixed-rate, long-term contracts remain by far the largest portion of mortgages in S&L portfolios.

While shorter run changes in the return on new mortgages have little effect on ROM, long-run movements in RNM do greatly affect ROM. Thus, ROM trended upward during the 1971-81 period, reflecting the upward trend in RNM (Chart 5). Due to the low turnover rate, though, movements in ROM lagged movements in RNM, so that ROM remained below RNM. Moreover, the gap between ROM and RNM has increased since 1978, due to two factors: the sharp rise in RNM and the slowdown in the turnover rate of mortgages, which reflects a decline in the gross amount of new mortgage loans closed. At the end of 1981, the gap between ROM and RNM was more than 4.5 percentage points.

The return on new mortgages depends, of course, on the market interest rate on new mortgage loans. Thus, the upward trend of RNM between 1971 and 1981 and its sharp rise since 1978 reflect similar movements in the

market interest rate on new mortgage loans (Chart 5). However, the spread between RNM and the market rate on new mortgages has widened considerably in the past few years, due in part to the increased use of "blends."¹¹ A blend is issued by an S&L to the new buyer of a home on which the S&L holds an assumable mortgage. The borrower is given a blended rate; that is, on the existing loan amount, the original rate remains, but on any additional funds, the borrower must pay a higher rate.

Blends have enabled S&L's to close new loans and remove some older, lower-yielding mortgages from the books, and also to compete with the creative financing techniques which avoid S&L involvement. The rate on a blended loan, however, is below the current market rate on a new loan and therefore widens the gap between RNM and the current market rate. By 1981, the various factors influencing RNM have resulted in a gap of 2 percentage points.

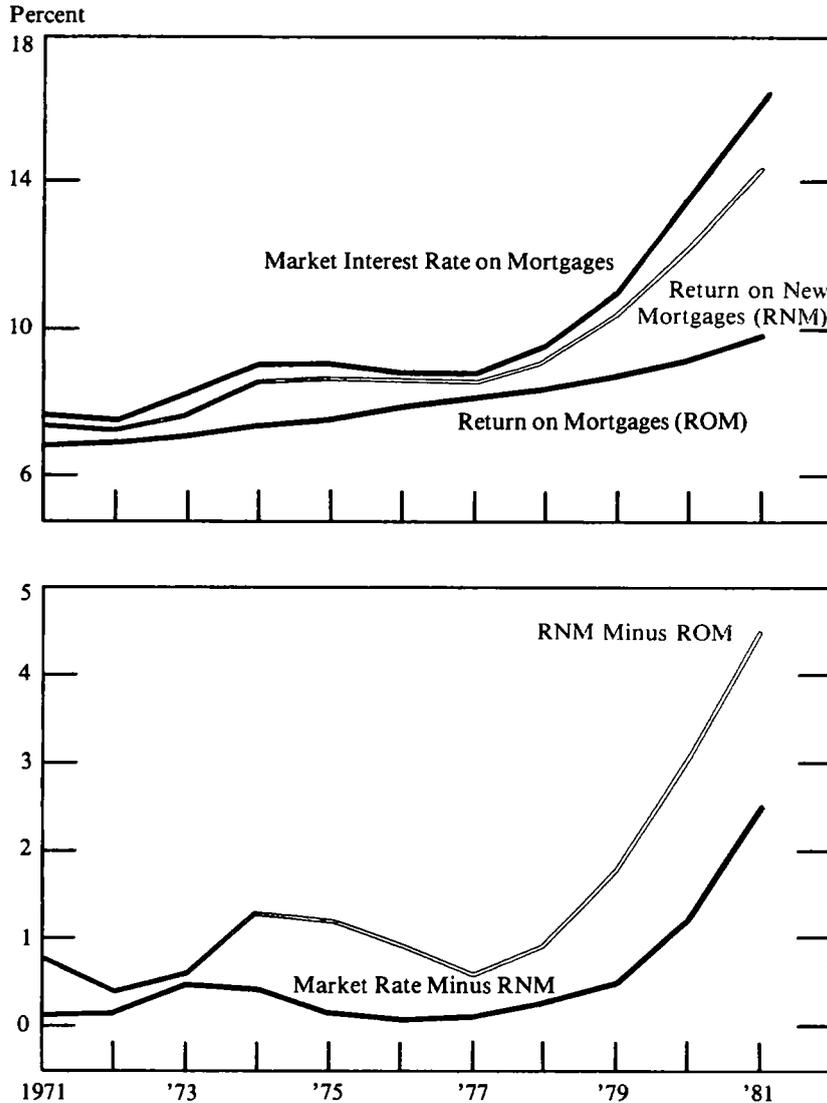
In summary, the return on S&L mortgage portfolios—and therefore the gross return on assets—has increased in recent years. However, due to the sharp rise in the market interest rate on mortgages, a decline in the turnover rate on mortgages, and other factors, ROM has not kept pace with the rise in the market rate on new mortgage loans. By 1981, the spread between the market interest rate on mortgages and the return on S&L mortgage portfolios had reached 6.7 percentage points, compared with an average of 1 percentage point in the 1971-78 period. As will be discussed later, this was a major factor contributing to the losses experienced by the industry.

Profitability—The Liability Factors

For S&L's, the second constituent ratio of ROA—the ratio of expenses to assets—depends mainly on the interest cost of deposits and borrowings rather than on noninterest operating expenses. The cost of borrowed funds has in re-

¹¹ Other factors have also influenced this spread. The increased use of variable-rate and variable-term mortgages has widened the spread because these types of mortgages have initial contract interest rates that are below new conventional fixed-rate loans. In addition, the prolific issuance of mortgage revenue bonds by states and municipalities to provide funds to borrowers for housing at rates well below market rates has widened the spread, because some of these loans are counted as new loans closed on S&L books. For additional discussion on types of blends and creative financing techniques, see John N. Frank, "Creative Financing: Time Bomb With a Short Fuse," *Savings and Loan News*, January 1982.

Chart 5
RETURN ON MORTGAGES AND RELATED MEASURES
OF INSURED SAVINGS AND LOAN ASSOCIATIONS
1971-81



SOURCE: Board of Governors of the Federal Reserve System and Federal Home Loan Bank Board.

NOTE: The market interest rate on mortgages is the average rate on new commitments for conventional first mortgages on new homes.

The return on new mortgages is the contract interest rate on all mortgage loans closed.

The return on mortgages is the interest earned on mortgages divided by average mortgages outstanding.

cent years had an increasingly larger impact on the expense ratio, as S&L's have increased their borrowings in response to a slowdown in deposit growth. Nevertheless, interest paid on deposits continues to account for most expenses. Thus, just as the gross return on assets follows closely movements in the return on mortgages, movements in the expense ratio closely parallel movements in the average cost of deposits (Chart 4).

The cost of deposits at S&L's depends on the relative importance of different types of deposits in the deposit structure and the cost of the various types. The latter, in turn, depends on the behavior of short-term market interest rates, along with interest rate ceilings that prevent S&L's from offering market rates on deposits.

Just as ROM has not been very responsive in the short run to changes in RNM, before 1979, the cost of deposits did not respond much to year-over-year changes in short-term interest rates. Thus, although short-term interest rates fluctuated sharply between 1971 and 1978, the cost of deposits showed relatively little year-over-year movement (Chart 6). The major reason for this unresponsiveness was the existence of ceilings on deposits that prevented S&L's from increasing their offering rates in line with market interest rates. The increases that did occur in the cost of funds prior to 1979 reflect increases in the ceiling rates on S&L deposits as well as rapid growth in small-denomination CD's having relatively high ceilings, accompanied by slow growth in passbook savings accounts, which had low ceilings. Small-denomination CD's rose from 45 percent of the total in 1971 to 58 percent in 1978, while passbook savings accounts dropped from 55 to 38 percent during the same period.

After 1978, the cost of funds at S&L's became much more responsive to movements in short-term interest rates, although in 1979 the

increase lagged somewhat behind the rise in short-term interest rates. In 1980 and 1981, however, increases in S&L cost of funds matched those of short-term interest rates. Thus, as shown in Chart 6, the gap between short-term interest rates and the cost of deposits, after rising somewhat further in 1979, remained relatively unchanged in 1980 and 1981.

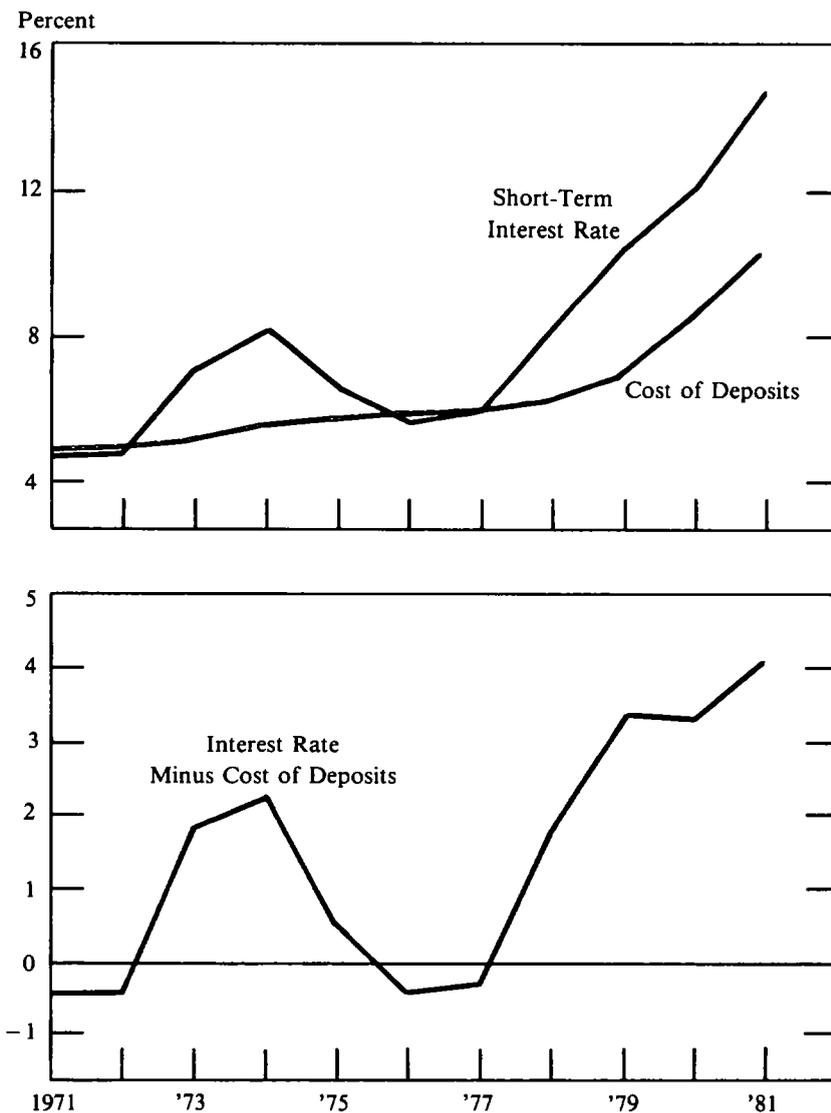
This increased responsiveness of the cost of funds to market rates, accompanied by a reduction in the stability of the sources of funds, was due to the introduction of shorter-term deposits with floating interest rate ceilings, and to the redistribution of S&L deposits away from passbook accounts and longer-term fixed-ceiling CD's into these new types of deposits. As a percentage of total deposits, passbook and fixed-ceiling certificates fell sharply after 1978, while floating rate deposits—6-month money market CD's and 2½-year certificates—increased (Chart 7). Also, large CD's—which are offered in denominations of \$100,000 or more and have no regulated rate ceilings—rose as a percentage of the total. The changing types and distribution of deposit accounts resulted in a massive shift from lower cost sources of funds (passbook deposits and fixed-ceiling certificates) to higher cost sources of funds (MMC's, 2½-year certificates, and large certificates). These higher cost sources of funds grew from 2 percent of deposits in 1978 to 64 percent at the end of 1981.

In summary, the cost of deposits for S&L's—and therefore the expense ratio—has increased sharply in recent years, due to a sharp rise in short-term interest rates and to the greater responsiveness of the cost of funds to movements in market interest rates. This rise in the cost of deposits has been a major factor contributing to S&L losses.

Profitability—Summary

As shown above, the return on assets, ROA,

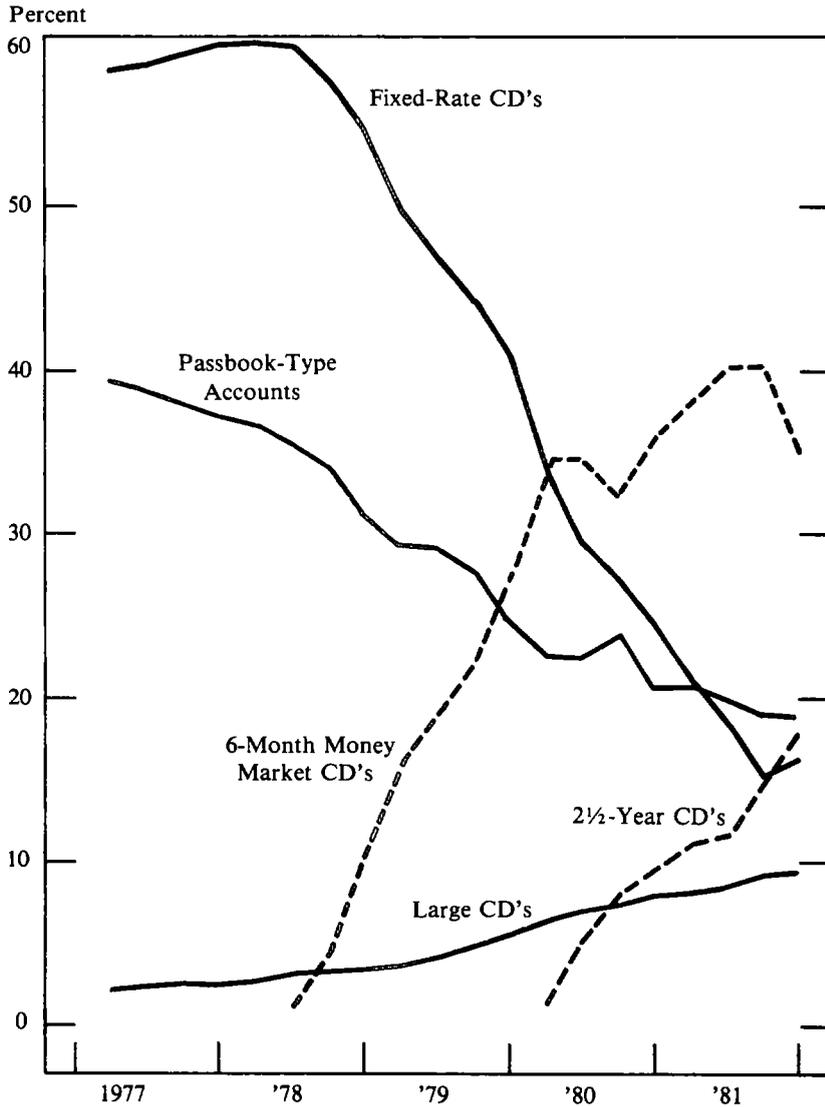
Chart 6
COST OF DEPOSITS AND RELATED MEASURES
OF INSURED SAVINGS AND LOAN ASSOCIATIONS
1971-81



SOURCE: U.S. Treasury.

NOTE: The short-term interest rate is the U.S. Treasury one-year constant maturity rate.
 The cost of deposits is the interest paid on deposits divided by average deposits.

Chart 7
DISTRIBUTION OF DEPOSITS OF
INSURED SAVINGS AND LOAN ASSOCIATIONS
1977-81



SOURCE: Federal Home Loan Bank Board.

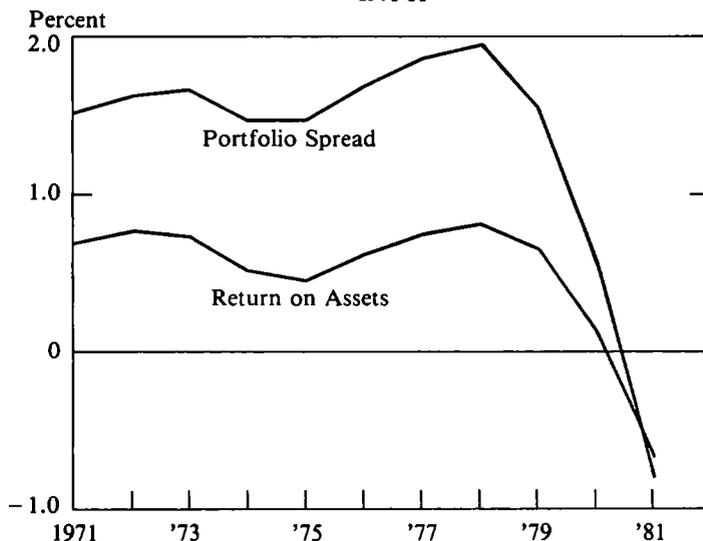
equals the gross return on assets minus the expense ratio. Also, it has been shown that, for S&L's, the gross return on assets parallels the return on mortgage portfolios, and the expense ratio parallels the cost of deposits. It follows that movements in ROA parallel movements in ROM minus the cost of deposits, which may be referred to as the portfolio spread. The general correspondence between ROA and the portfolio spread is shown in Chart 8.

The behavior of the portfolio spread—and therefore of ROA—depends on the behavior of the contract spread, which is the return on new mortgages minus the short-term interest rate, and the extent that the portfolio spread responds to changes in the contract spread. As shown in Chart 9, before 1979 the portfolio spread was not responsive, on a year-to-year basis, to fluctuations in the contract spread. This unresponsiveness reflects the fact that

ROM did not respond quickly to changes in RNM, and the cost of deposits did not respond quickly to changes in short-term interest rates. After 1978, however, movements in the portfolio spread followed more closely the sharp downward trend in the contract spread. This was due to the reduced responsiveness of ROM to RNM and to the greater responsiveness of the cost of funds to short-term interest rates.

The contract spread depends on the behavior of the market spread—the average rate on new commitments for conventional first mortgages on new homes minus the short-term rate of interest—and on the extent that the contract spread responds to movements in the market spread. Before 1980, the contract spread followed very closely changes in the market spread (Chart 9). In 1980 and 1981, however, the contract spread continued in a downward trend, while the market spread rose rather

Chart 8
THE RETURN ON ASSETS (ROA) AND THE PORTFOLIO SPREAD
OF INSURED SAVINGS AND LOAN ASSOCIATIONS
 1971-81



NOTE: The portfolio spread is the return on mortgages minus the cost of deposits.
 Return on assets is net after-tax income divided by average total assets.

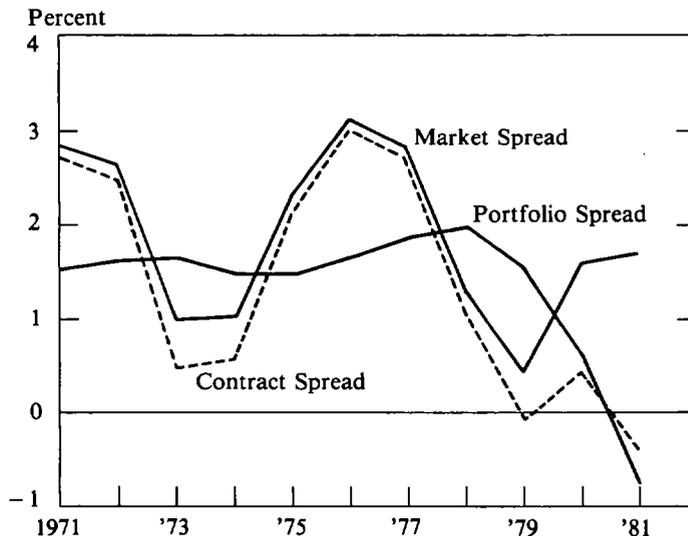
sharply. This was due to the failure of RNM to respond to the market interest rate on new mortgages, reflecting the inability of S&L's to close new loans at the market rate on mortgages.

In summary, the sharp 1979-81 decline in the portfolio spread—and therefore in ROA and in the level of profits—was due mainly to (1) the increased responsiveness of S&L cost of deposits to the sharp increase in short-term interest rates that occurred during the period, (2) the reduced responsiveness of ROM to the increase that occurred in the return on new mortgages, and (3) the reduced responsiveness of the return on new mortgages to the rise that occurred in the market interest rate on mortgages.

THE FUTURE PROFITABILITY OF THE SAVINGS AND LOAN INDUSTRY

The huge losses suffered by the savings and loan industry in 1981 reflect the seriousness of the problems facing the industry today. S&L's are unable to earn market rates of return on a substantial percentage of their assets due to their long-term nature and slow turnover. At the same time, the increased use of new short-term variable-rate deposit instruments in a high-interest-rate environment has greatly increased the cost of S&L deposits. As a result, there has been a large divergence between the portfolio and market spreads, with the portfolio spread decreasing sharply even though the market spread has remained relatively

Chart 9
PORTFOLIO SPREAD AND RELATED MEASURES
OF INSURED SAVINGS AND LOAN ASSOCIATIONS
1971-81



NOTE: The market spread is the average rate on new commitments for conventional first mortgages on new homes minus the U.S. Treasury one-year constant maturity rate.

The portfolio spread is the return on mortgages minus the cost of deposits.

The contract spread is the return on new mortgages minus the U.S. Treasury one-year constant maturity rate.

favorable.

A variety of short-term and long-term proposals have been made to remedy these problems. Some of these proposals are presented below along with a discussion of their potential impact on industry profitability.

Short-Run Solutions

Many observers contend that the key to helping the ailing savings and loan industry is for the level of interest rates to fall. It is argued that a drop in rates would increase the portfolio spread, as the cost of deposits would decline. At the same time, ROM would continue on an upward trend, since it is unlikely that the mortgage interest rate would decline enough to cause the return on new mortgages to fall below the current return on the S&L mortgage portfolio. Also, a drop in interest rates would likely be accompanied by a rise in the mortgage turnover rate, followed by an expansion in the volume of new mortgage loans.

While the argument that a drop in interest rates would enhance S&L profitability is no doubt valid, the extent of any increase in the portfolio spread would be limited by a number of factors. For example, the decline in the cost of funds would be limited if depositors responded to the decline in interest rates by rolling over their maturing short-term deposits into longer term deposits in order to avoid a reduction in the return on their savings. Also, the increase in ROM would be limited if individuals holding high-rate mortgages refinanced their mortgages as the mortgage rate dropped.

Thus, even if there is a decline in the level of interest rates, the profitability problems of the savings and loan industry would not be ended. For this reason, there would likely be continued efforts on the part of federal regulatory authorities to implement programs designed to assist troubled S&L's. These programs include

direct cash infusions by the FSLIC and the FDIC, accounting manipulations of net worth, and merger into other depository institutions.

Income capital certificates (ICC's) and purchase accounting methods are two tools used to accomplish these ends. ICC's are used to boost a deteriorating S&L's net worth in order to keep the net worth to total assets ratio above the level viewed as critical.¹² The FSLIC purchases ICC's from an S&L and in turn gives it cash or promissory notes, either of which is applicable to net worth. Mergers are facilitated by the use of purchase accounting methods, under which the assets and liabilities of the acquired S&L are given a fair market value. The difference between assets and liabilities—a revaluation of net worth—is then subtracted from the price paid for the S&L. The difference between purchase price and revalued net worth is known as goodwill, and it can be amortized over a period as long as 40 years. The newly acquired assets are written down to fair market value on the acquiring S&L's balance sheet, but then accrue to their previous book value over a period of years. The accrual period can be made shorter than the amortization period, and the discount accrual will create a positive impact on the acquiring S&L's net income in the early years. S&L's claim that this accounting technique should be available to associations not involved in mergers in order to enhance reported profits, but a leading industry accountant has suggested that this may not be a proper approach.¹³

¹² Currently, regulators and legislators believe that S&L's should maintain a minimum 2 percent net worth-to-total assets ratio.

¹³ Donald Zellmer, chairman of the Savings and Loan Committee of the American Institute of Certified Public Accountants, states that although he approves of the market-to-market concept, he is against a one-time writedown of assets that would be charged to net worth. See Karen Slater, "Key Thrift Accountant Backs Change," *American Banker*, May 4, 1982. For an excellent discussion of savings

Long-Term Solutions

There are two general approaches that have been discussed for developing longer run solutions for the savings and loan industry.¹⁴ The first approach focuses on providing S&L's with the proper tools to remain specialized mortgage lenders. To be effective, these tools would enable S&L's to maintain a pre-1978 position with respect to the portfolio and market spreads; in other words, they would allow S&L's to remain profitable in the face of fluctuating interest rates. This would be accomplished by bringing the maturity of mortgages more in line with the maturity of liabilities so that the return on mortgages would move with the cost of deposits, leaving the portfolio spread unchanged. By increasing the use of variable-rate and variable-term mortgages as well as financial futures, S&L's will be able to reduce the effective maturity of their asset portfolios. They could make greater use of long-term, fixed-rate liabilities, and deposit instruments in order to lengthen the maturity of liabilities and obtain a more certain long-term source of funds.¹⁵

and loan accounting methods and potential beneficial revisions, see the Task Force Report, pp. 24-42.

¹⁴ Some of the more recent studies which discuss the future of the savings and loan industry are Andrew Carron, "The Plight of the Thrift Institutions," The Brookings Institution, 1982; The President's Commission on Housing *Interim Report*, 1982; Joe Stillwell, "The Savings and Loan Industry: Averting Collapse," Cato Institute for Policy Analysis, February 15, 1982; and the *Report of the Task Force on Savings and Loan Portfolio Profitability*.

¹⁵ For a detailed description of variable-rate and variable-term mortgages, see Bronwyn Brock, "Mortgages with Adjustable Interest Rates Improve Viability of the Thrift Industry," Federal Reserve Bank of Dallas, *Voice*, February 1981, pp. 2-4. For a discussion of the use and risk of financial futures, see Robert L. Rosen, "Interest Rates, Default, and Basis Risk in Hedging Fixed-Rate Conventional Mortgages," Federal Home Loan Bank Board *Journal*, November 1981. For a discussion of mortgage-backed, or pay-through bonds, see the *Report of the Task Force on Savings and Loan Portfolio Profitability*, pp. 78-83.

The second longer term approach for solving S&L problems is to allow and encourage S&L's to diversify their assets and compete in the financial markets they feel would be profitable. S&L's could then invest in a short-term asset portfolio matched by short-term liabilities, or they could choose to match asset and liability maturities in a longer term range. In either case, the portfolio spread would remain relatively stable even though interest rates varied. Allowing S&L's to diversify their portfolios would make them more competitive in the growing financial services field. The implication to the economy is the loss of specialized institutions and the availability of funds for specialized purposes. However, diversification would allow S&L's to more ably compete with commercial banks, money market mutual funds, and the growing financial services conglomerates which are offering a complete slate of financial services in a relatively unregulated atmosphere.¹⁶

SUMMARY

The financial health of the nation's savings and loan associations has declined sharply since 1978, with the industry suffering a loss in 1981 greater than the gain enjoyed in any single previous year. The primary reasons for this drop in profitability are in the inability of savings and loan associations to earn market rates of return on new mortgages, the slow turnover of older, lower yielding mortgages, and the rapid escalation in the cost of deposits due to a greater responsiveness to increases in short-term interest rates.

In response to the losses experienced by savings and loan associations, a number of short- and long-run solutions have been implemented

¹⁶ Some of the financial services are various types of insurance, brokerage accounts, money market funds, credit and debit card accounts, and cash management.

or proposed. The short-run solutions—mergers, the use of income capital certificates, and purchase accounting methods—rely in part on a decline in the general level of interest rates. Longer term solutions would provide savings and loan associations with the tools needed to

remain specialized mortgage lenders or would broaden their ability to compete in other financial markets. To be effective, it is important that long-term solutions enable savings and loan associations to remain profitable in a wide range of financial environments.

The Cattle Industry in Transition

By Mark Drabenstott and Marvin Duncan

The U.S. cattle industry has been a major force in U.S. agriculture for nearly 150 years. Today that industry generates the largest single portion of farm cash receipts, accounting for nearly a 25 percent share in an average year. The Tenth Federal Reserve District includes an area encompassing a sizable part of that industry. Within the Tenth District, one-fifth of the U.S. calf crop is produced and one-third of the nation's fed cattle are produced and slaughtered. Hence, developments in the cattle industry are important to the agriculture of both the nation and the Tenth District.

The industry is currently undergoing significant change. Production patterns and practices are responding to changes in production costs and in consumer demand, which in turn are affected by such factors as macroeconomic policy, resource availability, and consumer preferences. These factors also result in changes in the financial needs of the industry.

This article examines the changes occurring in the U.S. cattle industry. Included in the discussion are changes over the past two decades in the supply and demand for beef, in the cattle cycle, in the scale of production units,

and in regional production patterns. Also discussed are future patterns of cattle production, profitability, and financial requirements to support such production.

CHANGING SUPPLY FACTORS FOR BEEF PRODUCERS

A number of factors have tended to raise production costs for beef producers in the United States over the past two decades. This section examines these factors, which may be classed into three categories: price inflation, high and volatile interest rates, and rising energy costs.¹

Production Costs and Inflation

For cattle producers, as for many other farm operators, increases in production costs are closely tied to price inflation. Farm input prices

¹ Beef imports also have become an important source of supply for U.S. consumers, with import volume increasing by nearly 50 percent over the past two decades. Imports have become particularly important as a source of manufacturing beef—lower quality beef for the processed meat and fast food industries. Imports of beef tend to rise in periods of declining production, such as 1976 through 1979, when imports rose from 8.1 to 11.3 percent of domestic production. This has been true especially since January 1980, when Congress began regulating beef imports into the United States on a countercyclical basis. Under current legislation, imports serve as countercyclical supply substitutes, smoothing out total domestic supply fluctuations and moderating price fluctuations over the cattle cycle.

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increased 233 percent from 1962 to 1981 compared to a 201 percent increase in the Consumer Price Index (CPI). During the same time period, the prices received by livestock producers rose by only 171 percent.² Prices for both farm inputs and consumer items increased more rapidly in the 1970s than in the 1960s.

Two important inputs for cattle producers—feed and replacement livestock—have increased in price over the past 20 years at a less rapid rate than both overall farm inputs and consumer prices. Reflecting the fact that grain and livestock prices generally have not kept pace with inflation, feed prices increased only 164 percent during the 1962-81 period, while replacement livestock prices increased 190 percent.

Interest Rates

Farm loan interest rates have increased and have also become more volatile during the past 20 years. Nonreal estate farm loan rates remained fairly stable within a range of 6.75 - 8 percent from 1962 to 1971. However, loan rates have more than doubled in the past 10 years and have exhibited substantial volatility, ranging from 7.75 to 18.5 percent.

Cattle producers have felt the effects of higher and more volatile interest rates in three different ways. Higher real interest rates have reduced profit margins and placed a strain on cash flow by raising production costs. Also, volatile rates have increased financial risks for farm and ranch borrowers, as lenders have shortened maturities and adopted variable interest rates, thereby shifting more of the interest rate risk to borrowers. Finally, the high real interest rates of recent years have sharply increased debt service requirements and

² Source: *Agricultural Prices*, U.S. Department of Agriculture.

discouraged business expansion through debt financing.

Energy Costs

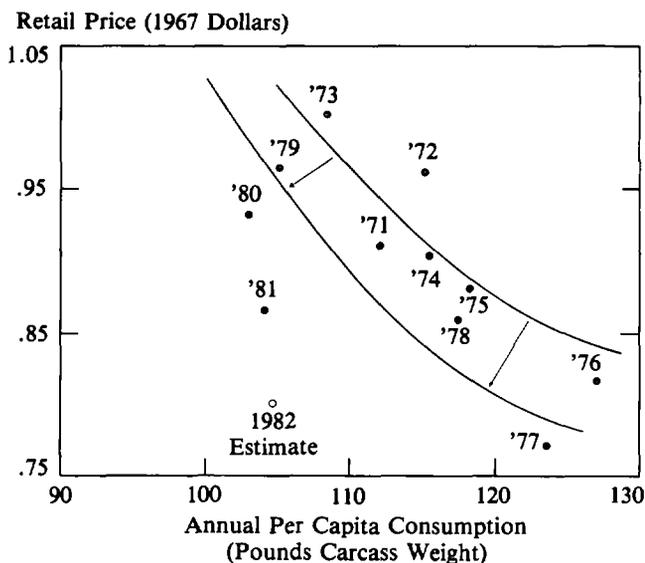
For most of the past two decades, cattlemen benefited from declining real energy prices. Inexpensive energy encouraged increased production of irrigated feed grains in the high plains and western portions of the United States. This availability of surplus feed grains fostered rapid growth of the cattle feeding industry in the southern plains.³ In addition, inexpensive transportation costs that resulted from low energy prices permitted the regional location of cattle production to be relatively insensitive to such costs.

Rising energy prices since 1973 have brought a changed economic environment for cattle producers. The prices paid by agricultural producers for fuels and energy-related items have nearly quadrupled during the past decade, the sharpest price increase of any farm input.⁴ Rising energy prices have tended to discourage further development of irrigated feed grain production in the high plains and western United States, since as energy prices rise, irrigation costs climb and profit margins decline for crop producers. Energy is the primary component in the cost of pumping ground water for irrigation; higher energy prices have thus shortened the economic life for irrigated feed grain production in the southern and northern plains. Rising energy prices, therefore, have increased production costs and may be inducing shifts in regional patterns of production.

³ Feed grain production has grown significantly in the southern plains states and especially in the northern plains states in the past decade. Annual feed grain production for these two regions combined averaged 1,675 million bushels from 1972 to 1981, compared to only 1,135 million bushels in the previous decade. Much of this boost in feed grain production has been the result of irrigation development.

⁴ Source: U.S. Department of Agriculture.

Chart 1
ILLUSTRATIVE DEMAND CURVES FOR BEEF IN THE UNITED STATES, 1971-81



SOURCE: U.S.D.A.

NOTE: While the demand curves are for illustrative purposes only and have not been statistically estimated, the data points do represent per capita consumption and beef prices for the years specified.

CHANGING DEMAND FACTORS FOR BEEF PRODUCERS

The past decade has produced both movements along as well as shifts in the demand curve for beef. Chart 1 contains two curves that serve to illustrate this consumer demand behavior. Movements along a demand curve have occurred in response to changes in the price of beef. For example, real beef prices declined substantially from 1973 to 1975, while consumption increased significantly, a response consistent with demand curve A. During the past five years, beef demand has apparently shifted downward to curve B. In support of this, real beef prices were nearly equal in 1972 and 1979, but consumption was considerably

lower in 1979.

The downward shift in beef demand has resulted from a number of factors. While beef continues to be a meat that many Americans prefer, demand has been reduced during the past few years as a result of relative price shifts among meats, slower growth in real disposable income, recent cutbacks in government food and nutrition programs, and a changing American lifestyle.⁵

⁵ The beef export market has grown steadily in the past two decades, but it still accounts for only a very small fraction of total demand for U.S. beef. In terms of quantity, beef exports have increased nearly fivefold between 1962 and 1981, but the export market still accounts for only 1.13 percent of domestic production. Past growth in exports has

Relative Price Shifts

Retail beef prices have risen relative to both pork and poultry prices. From 1962 to 1981, retail pork prices averaged almost 75 percent of retail beef prices. In the past few years, however, pork prices have declined relative to beef prices, averaging only 64 percent of beef prices since 1978. During the past two decades, the ratio of retail poultry prices to retail beef prices averaged 41 percent. However, poultry prices have fallen in comparison to beef prices recently, averaging only 30 percent of beef prices in the past three years.⁶

As a result of these relative price declines, pork and poultry consumption have increased. In the past three years, when relative prices have shown the most dramatic shifts, annual per capita pork consumption has risen 10 percent. Poultry consumption has shown an even more dramatic response, increasing more than 25 percent in the past three years. Over the same time period, per capita beef consumption has declined by 12 percent.⁷

Pork and poultry prices have fallen in the past three years because large supplies of these meats have been placed on the market by producers. Some analysts contend that greater production efficiency on the part of pork and poultry producers also accounts for some of the price reduction. These analysts argue that pork and poultry producers in the United States have achieved cost efficiencies that have been unmatched by the cattle industry. Poultry production has markedly changed over the past two decades, with large, vertically integrated pro-

demonstrated an upward secular trend, with little apparent cyclical behavior. This suggests that the quantity of beef exported may depend more upon foreign market development than on cyclical supply and demand factors.

⁶ Source: *Livestock and Meat Situation*, U.S.D.A.

⁷ Source: *Livestock and Meat Situation*, U.S.D.A.

ducers and processors now more common. Hog producers, to a lesser extent, also have moved to larger scale enterprises. Despite these economies of scale, it is unlikely that price declines for pork and poultry are associated only with efficiency gains. Cyclical changes in supply appear to be a factor as well.

Disposable Income

Changes in real disposable income also explain the apparent downward shift in beef demand. Real per capita disposable personal income has grown at a slow rate in recent years. Since 1978, real income has grown at an average annual rate of only 0.9 percent, a significant reduction from the more than 2 percent rate that Americans experienced in the 1960s and early 1970s. Consumers have responded to the squeeze on personal income by spending fewer dollars on beef and other meats. The share of disposable income spent on meat has declined from 4.51 percent in 1970 to only 3.75 percent in 1981. At the same time, the proportion of disposable income spent on beef has declined from 2.48 to 2.08 percent.⁸

Of course, identifying the precise links between income growth and meat consumption is not easy because other factors, including supply shifts, also influence meat consumption and expenditures. The total quantity of meat purchased has increased during the past five years relative to the early 1970s, in spite of very slow growth in real disposable income. One partial explanation for this is that large meat supplies in recent years have driven down prices, enabling consumers to purchase greater quantities of meat using a lower proportion of disposable income. However, had income growth been stronger, consumers likely would have paid higher prices for the quantities produced, or

⁸ Source: Livestock Business Advisory Service.

alternatively, would have purchased greater quantities at existing prices.

Government Food Programs

Federal food and nutrition programs have grown at a very rapid rate during the past 20 years. In 1961, the year the Food Stamp program began, total federal expenditures for Food Stamps and School Lunches totaled \$227 million. Federal outlays for the Food Stamp, School Lunch, and School Breakfast programs totaled \$12 billion in 1980.⁹ Thus, federal expenditures for these primary programs have grown at a compound annual rate of nearly 25 percent. Moreover, these programs have grown by 65 percent just since 1977.

Government food programs probably constitute a small, but significant, portion of total U.S. beef demand. No official estimate of what proportion of these program dollars are spent on beef is available. On the basis of U.S.D.A. aggregate consumption figures, however, federal food and nutrition programs likely accounted for at least 4 percent of total consumer expenditures for beef in 1980.¹⁰

Present food programs will likely operate at reduced levels in the future. Increased attention to a balanced federal budget has already brought about cutbacks in food and nutrition programs in 1981, and further reductions appear to be in prospect. These program cutbacks may remove a segment of American consumers

⁹ Source: Food and Nutrition Service, U.S.D.A.

¹⁰ The average U.S. consumer spent approximately 16.5 percent of each food dollar on beef in 1980, according to U.S.D.A. figures. Therefore, with food and nutrition programs injecting \$12.2 billion into consumer food budgets in 1980, one could assume that roughly 16.5 percent of this, or \$2.01 billion, was spent on beef. Total consumer expenditures for beef totaled \$50.1 billion in 1980. Combining these two figures, federal food and nutrition programs likely accounted for at least 4 percent of total U.S. consumer expenditures for beef.

from the retail market for beef.

Changing American Lifestyle

With greater mobility and higher incomes, Americans are eating less food at home and a greater amount away from home. In 1960, Americans spent 20.0 percent of their disposable personal income on food, with 4.0 percent of that income consumed away from home. The share of disposable personal income spent on food declined to 16.6 percent in 1980, largely the result of efficiency gains in U.S. food production. However, the share of income spent on food away from home rose to 4.4 percent.¹¹

The demand for lower quality, nonfed beef has risen relative to fed beef as a result of the trend to greater away from home consumption. A large share of the beef consumed away from home is ground beef made from lower priced cuts. From 1960 to 1980, the share of consumer expenditures for beef spent away from home increased from 36 to 43 percent.¹² This, in combination with the types of beef consumed away from home, suggests that a larger share of total beef demand consists of the relatively cheaper cuts of beef.

Americans also are eating lighter diets than they did 20 years ago. Heightened consumer awareness of weight control and health have encouraged Americans to shift away from high fat and starch intake. Americans are also emphasizing fruits and vegetables in addition to leaner meats such as poultry. This move to lighter diets shows no sign of abating, and consequently may continue to have some dampening effect on the demand for beef.

In summary, a number of factors have combined to reduce U.S. beef demand in recent

¹¹ Source: U.S. Department of Agriculture.

¹² Source: U.S. Department of Agriculture.

years. Declining relative prices for competing meats have caused consumers to shift their meat consumption away from beef. A slow rate of growth in real disposable income also has limited beef demand. Government food programs have boosted the demand for beef in the past, but cutbacks in these programs will likely dampen it. Finally, demand for nonfed beef has increased as a result of a changing American lifestyle, while an emphasis on lighter diets has reduced total beef demand.

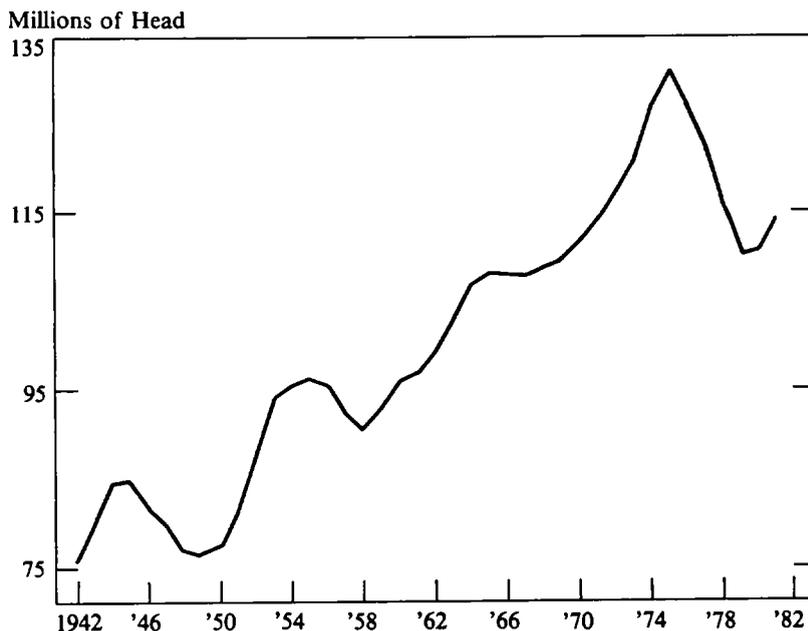
THE CATTLE CYCLE AND INDUSTRY PROFITABILITY

The U.S. cattle industry has been characterized by patterns of cyclical inventory accumulation and liquidation going back in time to at least the late 1800s. These cycles have typically taken from 8 to 12 years to complete—from in-

ventory peak to inventory peak. Such cycles occur because cattle producers, during periods of high profitability, individually make decisions to expand output without considering the impact of such collective decisions on the industry as a whole. Hence, output is expanded beyond profitable levels. Losses are then incurred that trigger inventory liquidation to levels below profitable equilibrium. Inventory liquidation continues until profits earned are substantial enough to attract increased production, and then a new cycle starts again.

Since 1975, the cattle cycle has not followed a normal pattern. In the past, each iteration of the cycle has produced a peak in cattle numbers well above the previous one (Chart 2). With mounting losses during 1974 and 1975, producers began a herd liquidation that was much more severe than normal because of declining

Chart 2
U.S. CATTLE INVENTORY, 1942-81



SOURCE: U.S.D.A.

demand for beef and rising production costs. The changed supply and demand factors outlined earlier have discouraged rapid expansion of the herd, and inventory numbers remain well below the peak level of 131 million head reached in 1975.

Profit levels from cattle production are related to both demand and supply factors. During the latter part of the 1960s and the early 1970s, both of those factors tended to add strength to market prices for beef cattle and to industry profitability. The cattle industry was profitable enough to attract substantial investment from sources outside of agriculture. These investments in both ranching and cattle feeding were motivated by profit expectations and, importantly, by opportunities to defer income for tax purposes. Consequently, overexpansion was encouraged in the industry. As the industry entered the liquidation phase of the cycle, beef prices dropped precipitously.

The cattle industry has not experienced sustained profitability for all segments since 1974. Cattle prices peaked by 1974, and inventory numbers peaked in 1975. More specifically, cattle feeders have incurred losses in 46 of the 84 months from 1975 through 1981. Until 1979, a sharp liquidation in inventory resulted in large supplies of beef in competition with other meats. That meant that cattle prices frequently failed to cover full costs of production for both cow-calf producers and cattle feeders. Since that time, rapid inflation and macroeconomic policies to deal with inflation have resulted in cost pressures, weak demand, and less than profitable prices for one or more segments of the industry.

THE SCALE OF CATTLE PRODUCTION

The scale of cattle production units has changed considerably in the past 20 years. This section reviews these changes, looking specifically at the increases that have occurred in the scale of cow-calf and cattle feeding

operations. Cow-calf operations refer to livestock enterprises in which a cow herd is maintained, calves are raised, and the calves are sold after weaning from the mother cows. Cattle feeding refers to the practice of feeding fattening rations to young cattle kept in feedlots, with the animals being sold for slaughter at 950-1,100 pounds of weight.

Cow-calf production has increased in scale to some degree during the past two decades, but small-scale producers still play the dominant role. The share of total sales controlled by medium and large operations—farms with annual calf sales greater than 100—increased moderately between 1964 and 1978 (Table 1). However, small-scale farms and ranches—operations with annual calf sales less than 100—still account for nearly two-thirds of total U.S. calf sales.

Cow-calf production has remained small in size despite additional economies of scale that might be achieved.¹³ The ease of combining cow-calf enterprises with part-time farms and with other production enterprises on larger farms may provide an explanation for the relatively small scale of feeder cattle production. Further economies of scale, however, are possible in the three main calf producing regions—the southern plains, southeast, and north central. In the southern plains, the greatest economies of size are gained in moving from a small operation to a medium one (annual calf sales between 100 and 200). The decline in production costs is achievable because total fixed costs can be spread over a larger scale of operation with only modest in-

¹³ Economies of scale refers to lower per-unit costs of production as the number of units produced increases (a downward sloping long-run average cost curve over the relevant sizes of production plants—in this case, numbers of feeder cattle being produced).

Table 1
SCALE OF CATTLE PRODUCTION IN THE UNITED STATES

Cow-Calf					Cattle Feeding				
Number of Cattle	Share of Total Operations (percent)		Share of Total Sales (percent)		Number of Cattle	Share of Total Operations (percent)		Share of Total Sales (percent)	
	1964	1978	1964	1978		1964	1978	1964	1978
1-4	29.8	24.0	3.9	2.6	1-49	72.8	81.0	14.2	8.3
5-19	46.1	45.3	26.1	19.8	50-99	13.3	7.8	11.2	4.8
5-9	N.A.	21.4	N.A.	6.1	100-199	8.0	5.1	13.1	6.0
10-19	N.A.	23.9	N.A.	13.7	200-499	4.2	3.7	14.9	9.4
20-49	17.9	21.4	28.6	26.5	500 or more	1.6	2.0	46.7	71.5
50-99	4.1	5.9	14.8	16.4					
100-499	2.0	3.1	18.9	23.6					
500 or more	0.1	0.2	7.7	11.2					

SOURCE: Census of Agriculture.

creases in variable costs. The southeast exhibits fairly uniform economies of scale in moving from a small to medium to large operation. Because many crop farms in the southeast are small relative to other regions, total farm fixed costs are low. Fixed costs for cow-calf enterprises that share these total farm fixed costs are correspondingly low. In the north central region, few economies of scale are evident because high total fixed costs necessary for row crop operations must be shared by cow-calf enterprises.¹⁴

Cattle feeding production has grown in scale at a rapid pace during the past two decades. A shift toward commercial feedlots (annual sales of at least 2,500 head) and away from farm-size operations has been the principal factor in this trend. Feedlots with annual sales in excess of 500 head accounted for only a minor share of all U.S. cattle feeding operations in both 1964 and 1978 (Table 1). However, the share of total fed cattle sales controlled by these feedlots in-

creased from 46.7 percent in 1964 to 71.5 percent in 1978. In addition, more than 58 percent of total fed cattle sales in 1978 were controlled by commercial-sized feedlots.

Significant cost economies have encouraged the trend to large-scale commercial feedlots that can sharply reduce fixed costs per marketed animal through more intensive utilization of fixed resources. In 1979, for example, fixed costs per hundredweight of beef marketed averaged \$5.62 for an average farm-size feedlot, compared to only \$0.80 for a commercial feedlot.¹⁵ Total costs were 11 percent lower for commercial feedlots in 1979 than for small farm feedlots (Chart 3). The largest farm feedlots, however, had costs only slightly higher than those for commercial feedlots.

While commercial feedlots do have lower total costs, they are more vulnerable to increases in input prices since nearly 99 percent of their total costs are variable costs. Farm

¹⁴ Cost of production data were obtained from the Firm Enterprise Data System, a system of budgets maintained by the U.S.D.A. in cooperation with Oklahoma State University.

¹⁵ Cost-of-production data were obtained from *Costs of Producing Livestock in the United States—Final 1979, Preliminary 1980, and Projections for 1981*, prepared by the Economics and Statistics Service, U.S. Department of Agriculture, for the Senate Committee on Agriculture.

feedlots, on the other hand, are somewhat more resilient with respect to input price increases, since only 84 percent of their total costs are variable costs.

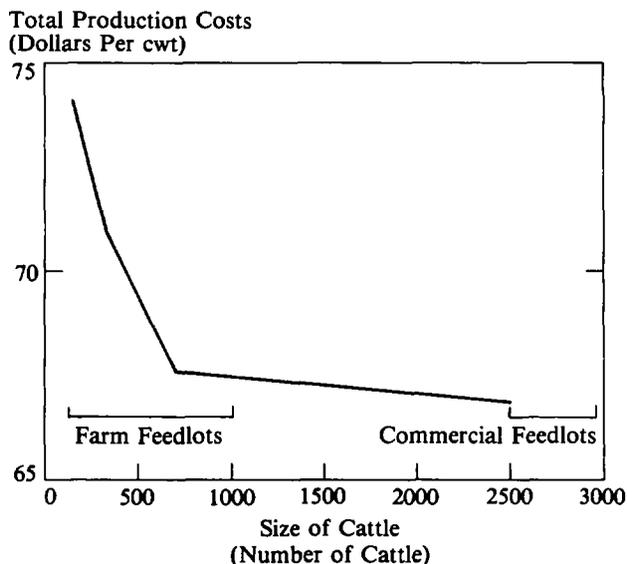
REGIONAL PATTERNS IN CATTLE PRODUCTION

The past two decades have witnessed significant shifts in the regional location of cattle production. The traditionally strong beef-producing regions—the north central and the southeast—have lost some of their relative importance, while the southern plains and other western portions of the United States have grown in importance (Chart 4). Shifts in the regional shares of the total U.S. cattle and calves inventory reflect these trends. The north

central and southeast regions held 46 percent of the U.S. cattle and calves inventory in 1964, but only 41 percent in 1978. The southern plains, meanwhile, increased their share of total cattle and calves inventory from 18 to 23 percent.

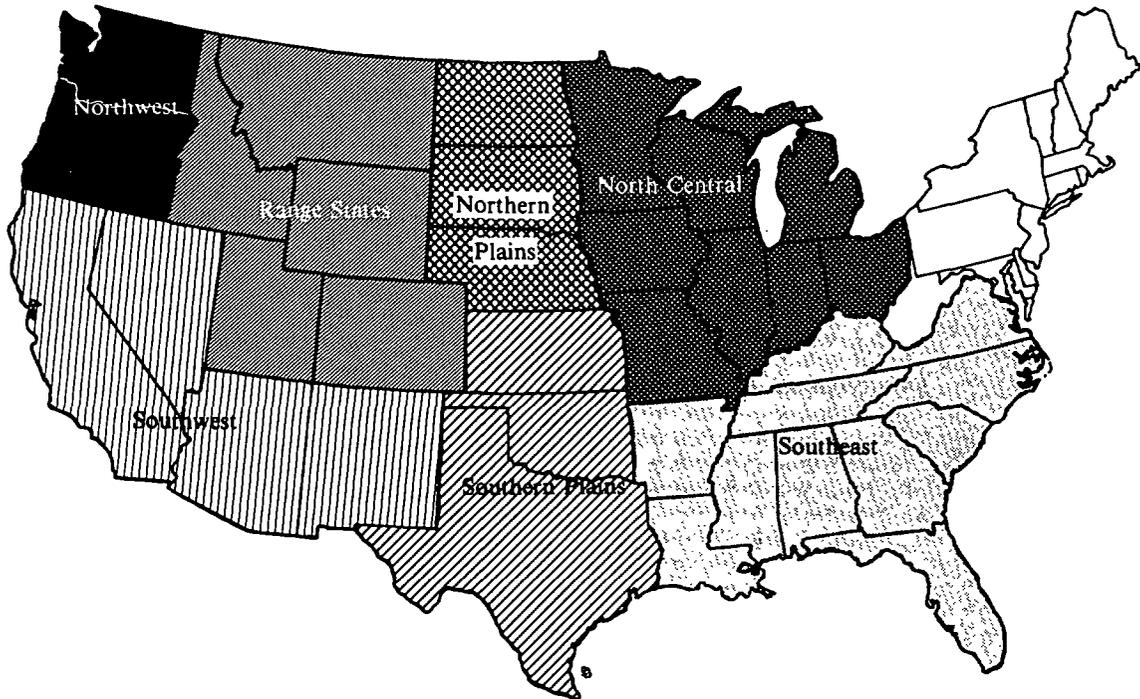
Cow-calf production has shifted only moderately among regions over the past 20 years. Production has moved from the north central to the southeast, but the southern plains continue to be the most important feeder cattle producing region (Table 2). Based on 1979 production cost data, four regions—the range states, southern plains, northern plains, and southeast—enjoy comparative advantage over the remaining regions—north central, northwest, and southwest.¹⁶ The range states had the lowest cost of production, while costs in the

Chart 3
ECONOMIES OF SCALE IN U.S. CATTLE FEEDING



SOURCE: Firm Enterprise Data System and U.S.D.A.

Chart 4
MAJOR CATTLE PRODUCING REGIONS IN THE UNITED STATES



northern plains were just slightly higher. These shifts in feeder cattle production are the result of both regional differences in production costs and the comparative advantage of other agricultural production opportunities across the regions.

Cattle feeding production has shifted dramatically from the north central and southwest regions to the southern plains over the past 20 years (Table 2). The north central region traditionally was the strongest cattle feeding region because of its ample supply of feedgrains. However, the southwest had become an important cattle feeding region in the 1950s and 1960s as large commercial

feedlots developed to utilize the available feeder cattle and feed grain supplies. In 1964, the north central and southwest contributed nearly 56 percent of total U.S. fed cattle production. By 1978, this share had declined to only 35 percent. Their relative losses in production shifted primarily to the southern plains where the share of U.S. fed cattle sales increased by more than 250 percent. Thus, by 1978, the southern plains had become nearly as important in fed cattle production as the other two regions combined.

THE FUTURE OF THE CATTLE INDUSTRY

The cattle industry will continue to be a major force in U.S. agriculture during the remainder of the 1980s. However, a changing economic environment will determine both the profitability and the size of the industry.

16 Cost-of-production data were obtained from the Firm Enterprise Data System.

Moreover, there may be regional production shifts within the industry. The structure that emerges in the coming decade will significantly affect the financing that flows to the cattle industry, in terms of both quantity demanded and lender source.

Future Profitability

Through a substantial increase in nonfed slaughter during the current cattle cycle, cattlemen have limited the supply of beef marketed to levels that have provided a much needed positive profit margin to cattle feeders in 1982. For example, fed cattle prices between January 1 and July 1 of this year have increased by 19 percent, while total beef production has fallen 1.2 percent below the same period last year. Even though producers of calves and feeder cattle have not yet experienced profitable prices, it is likely that the lesson of limiting marketings to profitable levels is one they will attempt to apply.

Lower feed grain and protein supplement prices also have been a factor in a return to profitable feed cattle production this year. Feedstuff prices are apparently near a cyclical low and can be expected to turn up over the next year or two. However, the amplitude of

volatility in grain prices may be tempered somewhat during the 1980s as compared to the 1970s. A slower forecast rate of growth in U.S. grain exports could be expected to dampen grain price increases over the next few years. Thus, feedstuffs may be more affordable to cattle producers.

If sustainable progress is made in reducing inflation in the United States during the period ahead, the cattle industry will benefit from reduced cost pressures. It also will benefit from stronger product demand as national macroeconomic policy can be directed toward greater economic growth. The slower increases in the index of prices paid by farmers—up only 1.3 percent in the first half of 1982 compared to an increase of 4.2 percent for all of 1981—suggests that substantial progress is being made on the cost side of the equation. A return to positive real economic growth that is expected sometime in the latter half of 1982 would be associated with gains in employment and real disposable income and would set the stage for improved product demand.

While the cattle industry has experienced difficulty in adapting to a rapidly changing economic environment, progress is now being made in resolving those problems. Economic

Table 2
REGIONAL SHARES OF CATTLE PRODUCTION IN THE UNITED STATES
(Percent)

	<u>Cow-Calf</u>						
	<u>North Central</u>	<u>Northern Plains</u>	<u>Northwest</u>	<u>Range States</u>	<u>Southeast</u>	<u>Southern Plains</u>	<u>Southwest</u>
1964	22.9	9.6	2.6	7.7	18.9	24.8	6.1
1978	19.5	8.8	2.1	8.5	23.0	25.6	6.2
	<u>Cattle Feeding</u>						
	<u>North Central</u>	<u>Northern Plains</u>	<u>Northwest</u>	<u>Range States</u>	<u>Southeast</u>	<u>Southern Plains</u>	<u>Southwest</u>
1964	39.7	16.3	2.5	8.2	3.4	12.2	16.0
1978	26.5	14.8	2.1	10.9	3.0	32.4	8.7

SOURCE: Census of Agriculture.

expansion will prove to be very beneficial to cattle producers. Changes in the conformation—size and shape—of beef cattle and productive capacity of the nation's cattle herd will play an important role in returning the cattle industry to profitability. Many observers believe that regulatory and grading reform also will boost profits. Finally, improved management practices, with increased emphasis on long-run profitability for the different segments of the industry, are critically important to a brighter industry outlook.

Future Size

A combination of market forces which has significantly altered the pattern of the cattle cycle is likely to continue during the coming decade. The cattle industry may not be as large during the 1980s as it was during the 1970s. Cattle producers will encounter cost pressures and financial risks that will limit herd expansion, at least over the next few years. Consumer preferences for lighter diets, cutbacks in government food programs, and continued competitive prices for pork and poultry will limit demand growth for beef. This combination of supply and demand factors suggests that cattle numbers in the 1980s will remain below the peak of 131 million reached in 1975.

A smaller industry, however, does not mean an end to the cattle cycle. The basic cause of cyclical patterns in cattle inventory—overreaction by producers to market price signals—will remain. Large cattle producers whose primary business focus is beef will continue to respond sharply to price movements. Smaller producers, who typically have other farm enterprises, may be expected to make production plans with less regard to market signals.

Future Structure

The future scale of cow-calf production units may change only slowly. The trends of the past 20 years indicate that cow-calf production has

not adapted to large scale production as quickly and easily as cattle feeding. The relative ease of combining cow-calf operations with crop production in small- and medium-sized farms, or with off-farm employment, suggests that small producers will remain an important market segment in the future.

The next decade also may see a slowdown in the trend to very large commercial feedlots, and perhaps even a shift toward comparative advantage for farm-size feedlots. Commercial feedlots experienced such rapid growth in the 1960s and 1970s that a continuation of this rate of growth appears unlikely during the 1980s. With average profit margins for the cattle feeding industry that are likely to be positive but narrow, farm feedlots may be better able to withstand periods of negative profits. Renewed attention to farm firm resilience—reducing risks by diversifying farm enterprises—also may encourage more farm-size feedlots.

Some regional shifts in cattle production may occur during the coming decade. For example, cattle feeding may begin to move back to the western cornbelt from the southern plains. With rising energy prices and irrigation costs, the western cornbelt may regain comparative advantage in feed costs over the southern plains. Additionally, changed cropping patterns in major food and feed grain producing areas in response to rising energy prices could enlarge the forage base for increased cattle production in these areas.

In the case of cow-calf production, regional shares will likely remain relatively unchanged in the coming decade. The western United States is expected to enjoy comparative advantage in costs of production due to large supplies of relatively inexpensive rangeland. In addition, technological advances in forage production could set the stage for increased output in this area. The southeast, however, will continue to be the region where feeder cattle production has

the greatest capacity to expand. But sharp improvements in export grain prices could shift southeastern agriculture toward more crop production, thus limiting the potential there for increased livestock production.

Future Financial Needs

The cattle industry uses a significant portion of total farm sector nonreal estate debt. An estimated \$5.1 billion, or 16 percent, of total U.S. nonreal estate farm debt may be involved.¹⁷ The future credit demands of the cattle industry will depend on two primary factors—the size and the type of production units that prevail. The size of the cattle industry will be the major determinant. Because the cattle industry may be smaller in the coming decade, growth in the credit demanded by beef producers could slow. A return to profitability could be expected to attract increased investment from outside agriculture in cattle ranching and feeding, supplementing other financing available to the industry.

Rapid growth of commercial feedlots has tended to increase credit demand for the industry because these operators typically have a higher debt-to-asset ratio than farm feedlots. Therefore, if the coming decade witnesses a shift toward more farm-size feedlots, the rate of growth in the credit demanded by cattle feeders could decline.

The future structure of cattle feeding also will influence the lender share of financing ex-

tended. The trend to large commercial feedlots in the past two decades tended to support a shift from local and regional financing to money center and investment forms of financing. If farm-size feedlot operations increase and the growth in large commercial feedlots slows, more financing will originate from local and regional sources of funds—community banks, production credit associations, and regional banks. Cow-calf operators have, of course, typically utilized community-based credit sources—commercial banks or Farm Credit System outlets. No great change is seen in that relationship.

Lenders will feel the effects of emerging trends in the regional distribution of cattle production as well. Over the past 20 years, the portfolios of north central banks have become more concentrated in crop-based loans, while banks in the southern plains have seen a marked increase in cattle-based loans. If cattle feeding returns to the western cornbelt, banks there would experience a net increase in farm loan demand while loan demand could decline in the southern plains.

SUMMARY AND CONCLUSIONS

The cattle industry is currently in a state of transition. A new structure for the industry is emerging from this period of adjustment. The industry likely will be smaller in the future. The scale of production units may not increase as rapidly in the 1980s as in the 1960-80 period. Moreover, the regional distribution of cattle feeding may begin a shift toward the western cornbelt and away from the southern plains.

The credit needs of the cattle industry will change with its new structure. A smaller industry with more farm-sized production units may result in a reduction of the rate of growth in industry credit needs. With more farm feedlots relative to commercial feedlots, a shift to more local and regional sources of lending and less money center and investment sources

¹⁷ While no firm data are available, a rough estimate can be made assuming that beef's relative share of total farm cash receipts reflects its share of nonreal estate credit. The Federal Reserve's Terms of Lending Survey was used to determine what portion of nonreal estate debt was lent for the purpose of livestock production. This factor was then multiplied by the share of livestock farm cash receipts accounted for by beef to determine the portion of commercial bank nonreal estate farm loans flowing to the cattle industry.

could occur. The potential movement of cattle feeding to the western cornbelt from the southern plains would increase the rate of growth in credit demand for north central lenders while slowing growth in loan demand for southern plains lenders.

The cattle industry faces a potentially more favorable decade in the 1980s than it did in the 1970s. One or more segments of the cattle in-

dustry have endured financial losses almost constantly since 1974. Periods of financial stress likely will continue during the period of adjustment in industry size and in performance of the U.S. economy. However, with prospective reductions in inflation and a return to stronger economic growth—and with potential gains in productive efficiency—the cattle industry may be poised for a profitable decade.

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