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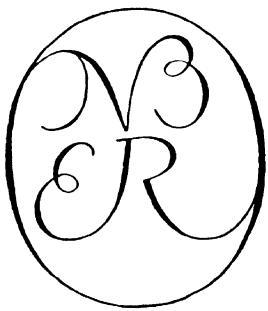
Studies in Agricultural Finance

1. Mortgage Lending Experience in Agriculture

Mortgage Lending Experience in Agriculture

BY LAWRENCE A. JONES

AND DAVID DURAND



A STUDY BY THE

NATIONAL BUREAU OF ECONOMIC RESEARCH, NEW YORK

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PREFACE

THIS volume on farm mortgage distress in the United States is the second publication in the National Bureau's series of Studies in Agricultural Finance. The first, "Costs and Returns on Farm Mortgage Lending by Life Insurance Companies, 1945-47," was published as an Occasional Paper in 1949; several others are in various stages of completion.

The present investigation was carried out under a cooperative agreement between the National Bureau of Economic Research and the Bureau of Agricultural Economics of the United States Department of Agriculture. Mr. Jones, on assignment from BAE, had primary responsibility for Part I, "The Economic Geography of Farm Mortgage Distress"; Dr. Durand, of the National Bureau staff, for Part II, "Farm Mortgage Distress and Individual Farm Organization." The study was financed largely with funds made available to the National Bureau through grants from the Association of Reserve City Bankers, the Life Insurance Investment Research Committee, acting for the American Life Convention and the Life Insurance Association of America, and the Rockefeller Foundation. The aid given by all of these agencies is very gratefully acknowledged.

R. J. SAULNIER
Director, Financial Research Program

September 1953

AUTHORS' ACKNOWLEDGMENT

SINCE the main purpose of our project was to determine some of the important causes of farm mortgage distress, we have given primary emphasis to the two decades between the world wars, when widespread debt difficulties occurred. We have, however, touched on the financial experience of farmers both before and after that period.

Basic data for our study were provided by the federal land banks, the central office of the Farm Credit Administration, several life insurance companies, the Federal Deposit Insurance Corporation, the Board of Governors of the Federal Reserve System, and the Bureau of Agricultural Economics. Without their cooperation the study would have been impossible. Also, great assistance in the form of supplemental background information about specific geographical areas was personally provided by many individuals both within and without the United States Department of Agriculture.

We are especially indebted to R. J. Saulnier, Director of the National Bureau's Financial Research Program, and Norman J. Wall, Head of the Division of Agricultural Finance of the Bureau of Agricultural Economics, for making the administrative arrangements that enabled the work to be carried forward on a cooperative basis, and for their reading and criticism of the manuscript; to Fred L. Garlock, also of the Bureau of Agricultural Economics, for his counsel at many stages in the work; to Frederick C. Mills and George J. Stigler for thoughtful criticisms as members of the National Bureau's reading committee; to Ruth Harris for drawing many of the charts; to Catherine Martin, Inge Falk, and Olive K. Britt for statistical computations and checking; and to Mary Phelps for editorial assistance. But above all, our thanks go to F. F. Hill, of Cornell University, for his indispensable aid. Serving as technical adviser and editorial critic, Dr. Hill devoted a great deal of time to the study, and contributed richly from his sound judgment and his extensive background in agriculture and agricultural credit.

LAWRENCE A. JONES AND DAVID DURAND

September 1953

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MORTGAGE LENDING EXPERIENCE IN AGRICULTURE

INTRODUCTION: HISTORICAL BACKGROUND

AMERICAN farmers have never known long periods of economic stability. The best available evidence of their changeable situation is the index of wholesale prices of farm products in the United States, which extends back to the end of the eighteenth century (Figure 1). In addition to relatively minor price movements, which have followed each other in rapid succession, the farm price index shows four violent movements since 1798, each associated with a major war. And according to the Warren and Pearson wholesale price index, there was another such movement during the years of the Revolution.[1] These disturbances are due, of course, to wartime inflation and increases in the demand for farm products, with a consequent rise in farm prices and incomes, and eventually in farm land values and debts. In the past, such periods of high prices and incomes have been short-lived, and the ensuing periods of depression have been severe and characterized by widespread farm mortgage distress. Whether the rise associated with World War II will have a like sequel remains to be seen. This introduction outlines the main features of the periods into which the last century and a half of agricultural history can be conveniently divided, with emphasis on trends affecting farm mortgage indebtedness and farmers' ability to carry such indebtedness.

Nineteenth Century

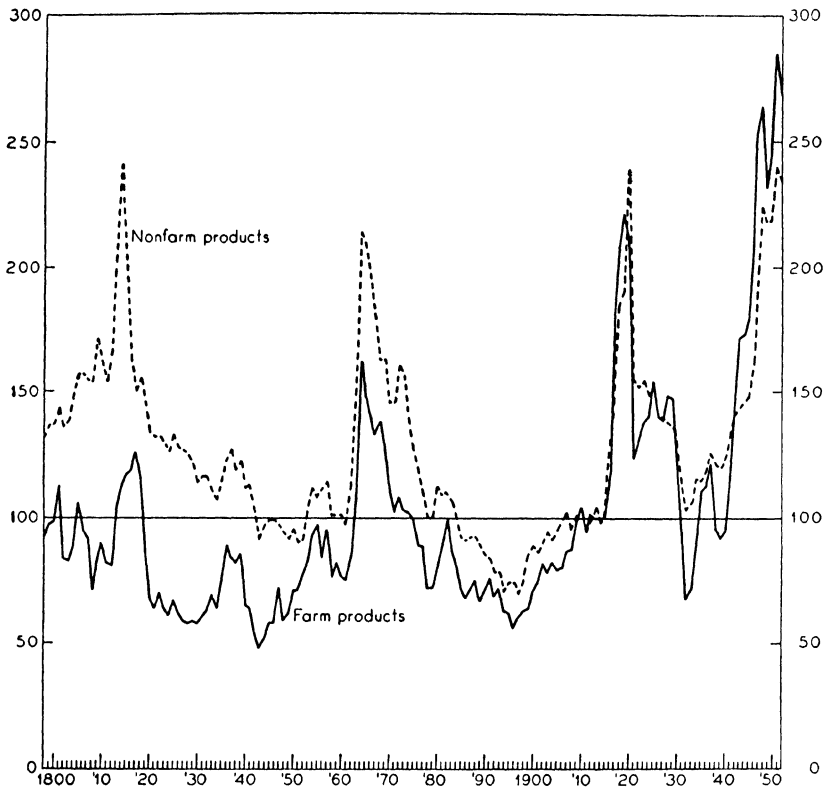
At the beginning of the nineteenth century the United States was recovering from the post-Revolutionary-War deflation.[2] As the Napoleonic Wars expanded the market for farm products, agricultural conditions improved, except for a brief period during which embargoes cut off exports, and agriculture entered a period of price inflation culminating in the boom that occurred during the War of 1812. Shortly after the peace the demand for American farm staples declined abruptly, and for

[1] *Historical Statistics of the United States, 1789-1945* (Bureau of the Census), p. 233.

[2] Few statistics are available concerning American business conditions following the Revolutionary War, but the newspapers carried many bankruptcy notices, and some states passed "stay and tender" laws providing moratoria for certain debts, or permitting debtors to tender goods, cattle, or land in settlement of their obligations.

nearly a decade after the panic of 1818-20 agricultural prices were low. Land values shrank drastically, and the subsequent debt difficulties of farmers and others resulted in legislation to protect and advance the interests of debtors. A Senate committee reported that "landed property was daily sacrificed at

Figure 1. Index of Wholesale Prices, Farm and Nonfarm Products, 1798-1952



BLS and Warren and Pearson indexes as compiled by Bureau of Agricultural Economics (1910-14 = 100), revised 1953. (Through 1948 as in **Agricultural Outlook Charts, 1950.**) Nonfarm products include all commodities other than farm products and foods.

sheriffs' sales for a half, a third, nay a quarter of its value, and hundreds of industrious farmers thereby deprived of their homes and the fruits of their labor. Merchandise, household goods, and farming stock, would not bring at forced sale one-half the cost of production."[3]

[3] John Bach McMaster, *A History of the People of the United States from the Revolution to the Civil War*, Vol. 4 (1897), p. 495.

In the 1830's there was a period of farm prosperity marked by heavy speculation in midwestern lands, followed by the panic of 1837 and generally distressed conditions. Agriculture and the rest of the economy suffered until 1843. Thereafter, except for a few years, agricultural prices were increasingly favorable until the end of the Civil War.

During the Civil War years farm prices doubled, and agriculture prospered except in much of the South. With the return of peace, however, prices started downward, credit tightened, and lenders began to call loans. A long period of depression ensued, which reached its depth in the panic of 1893. Heavy debts, along with declining incomes, caused widespread suffering among farmers, particularly in the West.

Twentieth Century through World War I

Around the turn of the century agriculture again entered a prosperous period. Developments in the two decades of prosperity up to 1920 laid the groundwork for much of the farm mortgage distress occurring between 1920 and 1940—the period with which our investigation is chiefly concerned.

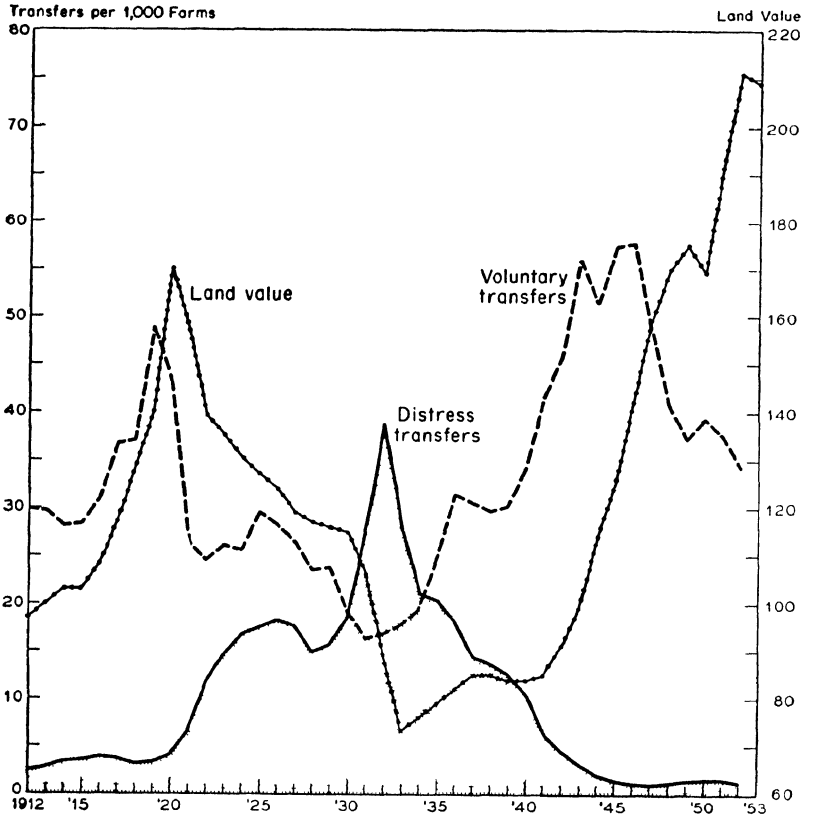
Prices of farm commodities rose steadily from their low point shortly before 1900 and by 1910 had nearly doubled. Between 1900 and 1910 the average value of farm real estate per acre doubled. Increases of 300 percent and more occurred in many counties in western Texas, the Great Plains, and the Mountain region. In those areas much new land had been brought under farming, including substantial acreages under irrigation. In the northeastern part of the nation land value increases were relatively small.

From 1910 until World War I agricultural prices were relatively stable. During the war they increased rapidly and by early 1920 were more than two and one-half times their average for the prewar years (1910-14). Farm land values, whose movements for the country as a whole are shown in Figure 2, also increased, until at the peak in 1920 they were 73 percent above their prewar level. Although land value increases were general, they were largest, percentagewise, in the Southeast and in the northwestern part of the Corn Belt, and smallest in the northeastern states. Regional differences in the rise of land values for the entire decade 1910-20 are shown in Figure 3.

The war years, and especially the postwar years 1919 and 1920, were characterized by a very active and speculative farm real

estate market. Foreclosures and forced transfers were relatively few. Profits were often invested in more land, livestock, and equipment. The feeling was widespread that prosperity would continue indefinitely. Many of the areas that were most pros-

Figure 2. Distress Transfers, Voluntary Transfers, and Value of Farm Real Estate per Acre, 1912-53

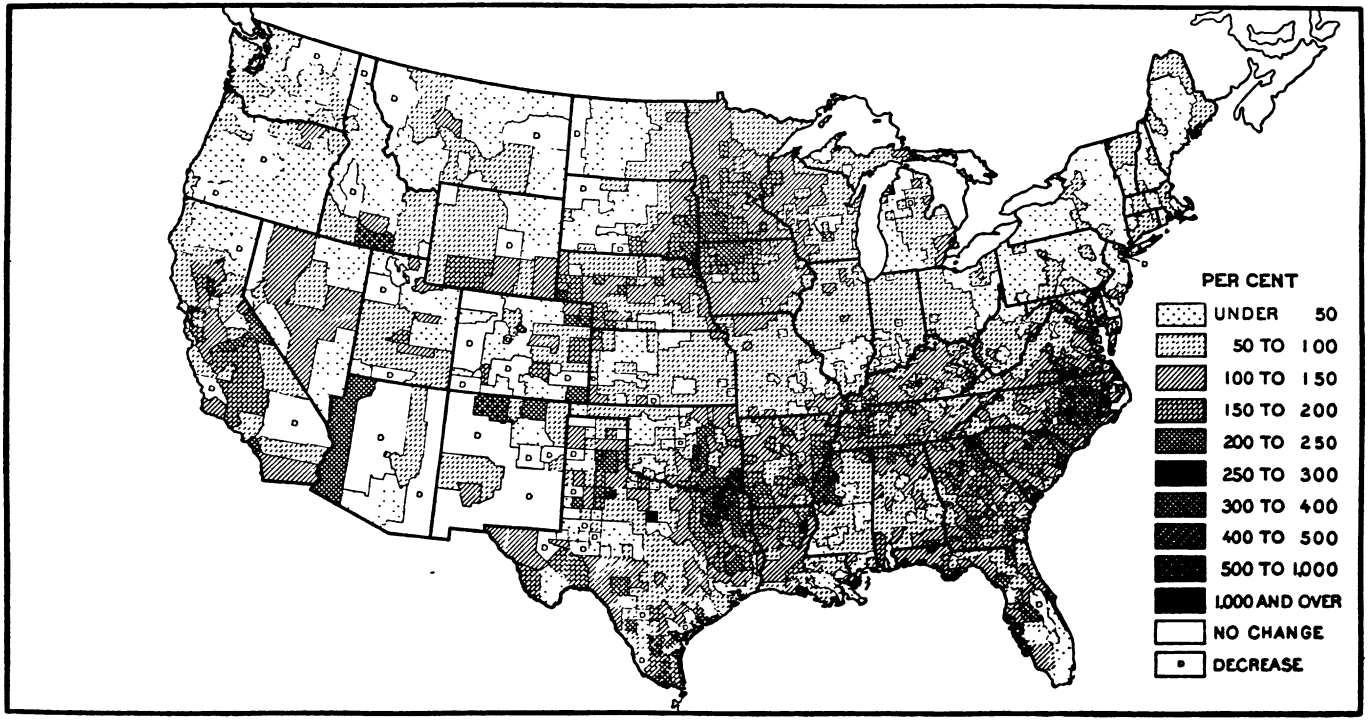


Adapted from a chart supplied by the Bureau of Agricultural Economics. Land value indexes (1912-14 = 100) refer to value of land and buildings as of March 1; transfer data refer to transactions from March 16 through March 15 of the following year. Distress transfers include assignments to avoid foreclosure, as well as foreclosures.

perous and in which land speculation was greatest during this period were to suffer the most severe distress in the subsequent farm depression.

Credit to finance both agricultural and industrial expansion was plentiful during World War I. Between 1915 and 1920 more than 3,000 new banks were organized, most of them in

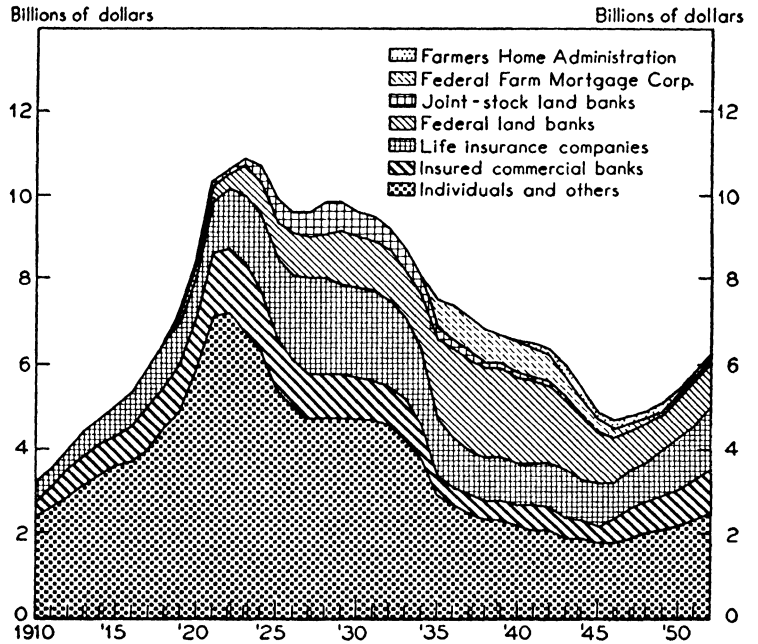
Figure 3. Increase in Value of Farm Real Estate per Acre, 1910-20



Map supplied by U.S. Department of Agriculture.
Based on census data for value of farm land and buildings as of April 15, 1910 and January 1, 1920.

the Midwest. Farm debt rose rapidly. Mortgages increased from about $3 billion in 1910 to $5 billion at the end of 1916 (Figure 4). By the end of 1920, farm mortgage loans had passed the $10 billion mark, which was twice the level of 1916 and over three times that of 1910. Non-real-estate farm loans of commercial banks also increased, rising from $1.6 billion at the beginning of 1915 to a peak of $3.9 billion at the end of 1920.[4] This

Figure 4. Farm Mortgage Debt Held by Major Lender Groups, 1910-52



January figures. Data for 1910-30 are from **Farm-Mortgage Credit Facilities in the United States**, by Donald C. Horton, Harald C. Larsen, and Norman J. Wall (USDA, 1942, p. 12); for 1931-34, from **Agricultural Statistics, 1948** (USDA); for 1935-52, from **Agricultural Finance Review** (BAE), Vol. 14, Supplement May 1952 (p. 2).

rapid growth of debt resulted partly from the need to meet higher operating costs, to acquire new equipment and additional livestock, and to expand acreage, but above all it arose from the purchase of farms in a rising land market. The Southeast and some areas of the West, particularly the Mountain states, showed the greatest rise in farm mortgage debt,[5] and in

[4] *Agricultural Finance Review* (Bureau of Agricultural Economics), Vol. 14, Supplement May 1952, Table 19, p. 27.

[5] *Ibid.*, Vol. 2, November 1939, Table 6, pp. 90 ff.

those regions land values also increased greatly.[6] In the Northeast, where the farm real estate market was relatively inactive, the rise in mortgage debt was comparatively small.[7]

One important characteristic of the wartime mortgage debt expansion was the sharp increase in the average size of new farm mortgages recorded. In 1917, the first year for which estimates are available, the average new mortgage loan amounted to $2,640. In 1918 and 1919 the averages were $2,880 and $3,460, respectively. In 1920 the average new farm mortgage loan amounted to $4,270.[8] The increasing size of mortgage loans meant in many instances an increase in the ratio of debt to value, even at the higher level of farm land prices. The census reported that for owner-operated mortgaged farms in 1910 the debt amounted to 27.3 percent of the value; by 1920 the debt was 29.1 percent of value.[9] Not only did the period give rise to larger loans, both in average size and relative to value, but the proportion of mortgaged farms went up. The census reported that 41.1 percent of all owner-operated farms were mortgaged in 1920, an increase from 33.6 percent in 1910.[10]

The Interwar Period

The agricultural depression of the interwar period began with a spectacular collapse of agricultural prices in mid-1920. In May of that year the index of farm prices reached 237 (1910-1914 = 100). By June of the following year the index had dropped to 111. On the cost side, prices paid by farmers for commodities used in production (including interest, taxes, and wages) also dropped, but much less sharply, from an annual average of 214 in 1920 to 155 in 1921.[11] The change in price relationships was in itself sufficient to produce a drastic shrinking of net farm incomes; and the situation was aggravated by droughts in several of the northwestern states. Naturally, the enormously expanded debt structure of agriculture was particularly vulnerable to such a shock. Credit began to tighten and many loans were called,

[6] M. M. Regan and A. R. Johnson, *The Farm Real Estate Situation, 1945-46* (U.S. Department of Agriculture, Circular No. 754), pp. 6 f.

[7] *Agricultural Finance Review*, Vol. 2, November 1939, Table 6, pp. 90 ff.

[8] *Average Size of Farm-Mortgage Recordings of Selected Lender Groups* (Bureau of Agricultural Economics, mimeo., November 1940), p. 3.

[9] 16th Census: 1940, *Agriculture*, Vol. 3, Table 6, p. 251.

[10] *Agricultural Finance Review*, Vol. 10, November 1947, Table 1, p. 63.

[11] Indexes of prices received and paid by farmers are the revised series of the Bureau of Agricultural Economics with January 1910 through December 1914 as the base period, from *Agricultural Outlook Charts, 1953* (October 1952), page 9.

beginning with short-term obligations. Many farmers were forced out of business, and others borrowed on their remaining real estate equity to repay their short-term loans. Refunding was largely responsible for the continued rise in farm mortgage debt, which reached its peak in 1923 (Figure 4).

Although by 1923 agricultural prices had made a substantial recovery from the low point reached in 1921, the recovery was not sufficient to restore price-cost relationships to the favorable wartime level. Largely as a result, realized net income of farm operators averaged 30 percent lower during the years 1923-29 than during 1919-20.[12] Throughout most of the twenties land values declined, reflecting adjustments to the lower level of farm incomes. These declines eliminated the equity of many farmers and often resulted in losses to lenders when foreclosure was necessary. Distress transfers (foreclosures, and assignments to avoid foreclosure) increased steadily after 1920. In that year they had occurred at the rate of 4 per thousand farms; by 1926 the rate of distress transfers was over 18 per thousand farms (Figure 2).

Banking operations are another indicator of economic conditions. Deposit withdrawals and the freezing of funds in unpaid loans were more severe in rural than in industrial areas. From 1921 through 1929, 5,411 state and national banks suspended operations; this was 18 percent of the number of banks active in 1921.[13] Of the suspended banks 92 percent were in small cities and villages of less than 10,000 population. Bank closings were particularly heavy in the Southeast, the Great Plains, and the Mountain states—predominantly farming regions. In the industrialized East and Northeast very few banks closed.[14]

After difficulties in the twenties, agriculture faced catastrophe in the early thirties. Prices of farm products dropped from the onset of the depression in 1929 until by 1932 they were less than half their 1929 average and were below the prewar prices of 1910-14.[15] Realized net income of farm operators, which had reached $9.3 billion in 1919 and averaged $5.7 billion during

[12] *The Farm Income Situation* (Bureau of Agricultural Economics), December 1952–January 1953, Table 1, p. 4.

[13] *Banking and Monetary Statistics* (Board of Governors of the Federal Reserve System, 1943), pp. 19 and 283.

[14] *Ibid.*, p. 284.

[15] *Agricultural Outlook Charts, 1953* (Bureau of Agricultural Economics, October 1952), p. 9.

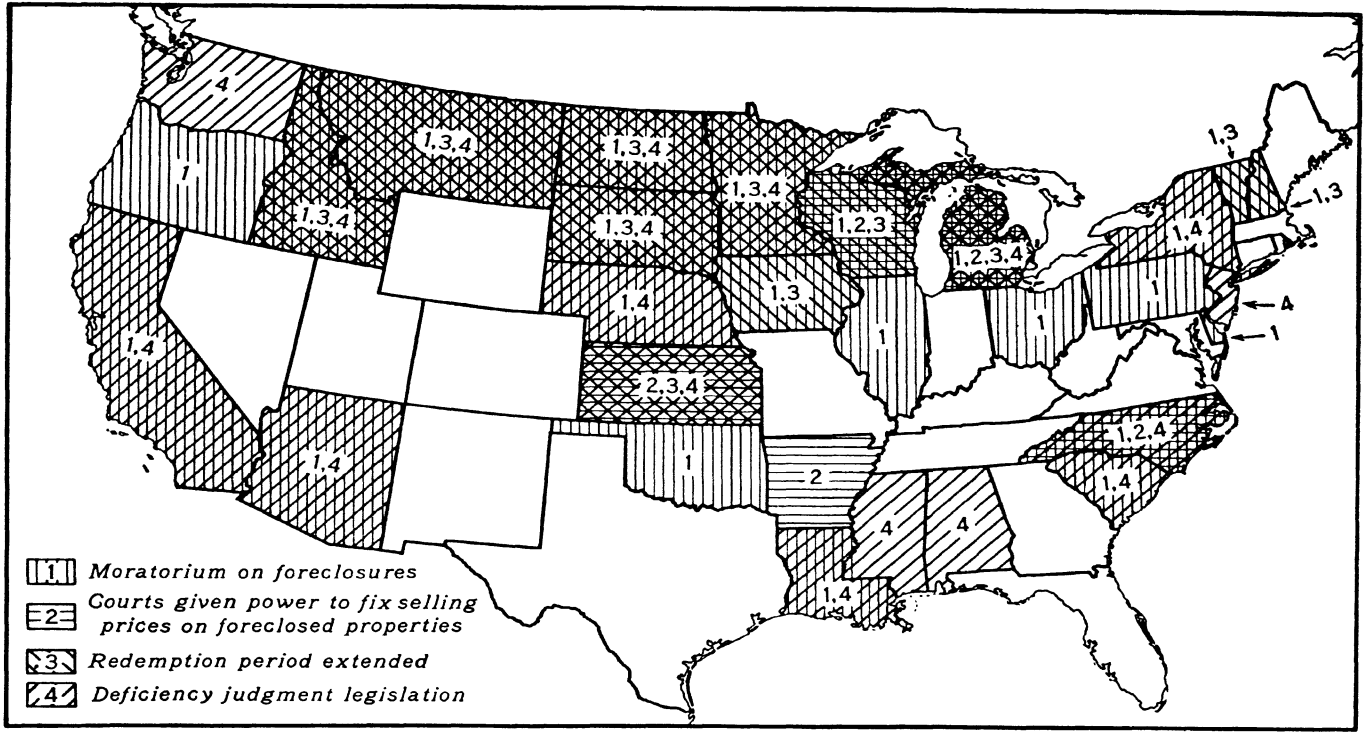
the years 1923-29, was estimated at only $1.9 billion for 1932.[16] Farmers found it difficult or impossible to pay debts contracted at higher income levels. Many loans were foreclosed and many others were refinanced by federal agencies. For agriculture as a whole, foreclosures and assignments to creditors rose from 15.7 per thousand farms in 1929 to 38.8 per thousand in 1932. Thereafter the rate of distress transfers slowly declined, but remained throughout the thirties well above the low level existing before and during World War I, and did not subside that far until 1942 (Figure 2).

In the early thirties economic conditions were so serious that several states passed laws that prohibited foreclosure, extended redemption periods, and eliminated deficiency judgments (Figure 5). Among the measures taken by the federal government were appropriation of additional funds for emergency crop and feed loans, establishment of regional agricultural credit corporations, bolstering the federal land banks with additional government capital, and the reorganization of the Federal Farm Loan System. Under the Farm Credit Act of 1933, direct government mortgage loans were provided for many farmers who did not qualify for regular federal land bank loans.

Out of the troubled thirties developed a different economic and social philosophy involving more direct and comprehensive action by the federal government in combating deflation. In addition to the extensive pump priming expenditures there were devaluation of the dollar, new banking legislation, and revised tariff laws—all devices intended to activate and strengthen the economy as a whole. For agriculture, the new legislation introduced acreage restrictions, marketing quotas, marketing agreements, price support loans, government purchases of commodities, parity payments, and the food stamp plan. These measures were intended to raise prices of farm products. There were also special programs aimed at improving the lot of the lower-income farmers and assisting tenants to become farm owners. In the last half of the decade realized net income of farm operators showed some improvement, averaging between $4 and $5 billion a year, more than doubling the low of $1.9 billion in 1932. Nevertheless, it was below the $5 to $6 billion level of the late twenties and substantially below the $9.3 billion peak of 1919.[17]

[16] *The Farm Income Situation*, December 1952–January 1953, Table 1, p. 4.
[17] *Ibid.*

Figure 5. State Mortgage Relief Legislation, 1930-36



Map supplied by U.S. Department of Agriculture, Bureau of Agricultural Economics.
Numbers in states refer to kinds of mortgage relief legislation enacted between January 1, 1930 and April 20, 1936.

World War II and the Early Postwar Years

Agricultural prosperity increased rapidly during World War II. By 1945 the level of agricultural prices was twice as high as that of 1940 (Table 1). Agricultural production, stimulated by high prices and favorable weather, was at record volume. Production costs were increasing, but not so fast as farm prices. Realized net income of farm operators rose sharply and for 1945 totaled $12.3 billion, almost three times the 1940 amount.[18]

TABLE 1

Index Numbers of Prices Received by Farmers, Prices Paid, Farm Production, and Realized Net Income of Farm Operators, 1940-52

(1940 = 100)

Year	*Prices received by farmers*	*Prices paid by farmers*[a]	*Farm production*	*Realized net income of farm operators*
1940	100	100	100	100
1941	123	106	103	141
1942	158	122	113	206
1943	192	137	117	268
1944	196	147	125	279
1945	206	152	122	286
1946	234	167	124	330
1947	275	193	123	390
1948	285	209	125	363
1949	249	202	125	316
1950	256	206	123	287
1951	302	227	127	333
1952	288[b]	231[b]	132	333[b]

Based on Bureau of Agricultural Economics indexes. For prices received and paid by farmers, see *Agricultural Outlook Charts, 1953* (October 1952), page 9, and *Agricultural Prices*, December 1952, page 27. For farm production and realized net income, see *The Farm Income Situation*, July-September 1951, page 5, and December 1952–January 1953, Tables 1 and 11, pages 4 and 16.

[a] Includes prices of commodities, interest, taxes, and wages.

[b] Preliminary.

After the end of the war in 1945, inflation continued in all segments of the economy. Agricultural prices continued to rise and the total realized net income of farm operators in the

[18] *Ibid.*

United States reached an all-time high of $16.8 billion in 1947. From then until the Korean outbreak the ratio of prices received by farmers to prices paid became less favorable, and net income of farm operators by 1949 had declined to $13.6 billion. Although agricultural prices increased during the last half of 1950, net income for the year declined further to $12.3 billion. Primarily as a result of increased defense activity, net income rose to $14.3 billion in 1951 and remained at that level for 1952.

Naturally, the long period of wartime prosperity had a pronounced effect on the financial position of agriculture. The *Balance Sheet of Agriculture*, prepared by the Bureau of Agricultural Economics, valued total assets of agriculture as of January 1, 1952 at $168.7 billion, more than three times the comparable figure, $53.7 billion, for 1940 (Table 2). As of January 1953 farm assets have been tentatively estimated at about $165 billion. Much of the increase in the values of real

TABLE 2

Balance Sheet of Agriculture, 1940 to 1953

(in billions)

	1940	*1946*	*1950*	*1952*	*1953*[a]
Assets					
Real estate	$33.6	$61.8	$75.3	$93.7	$92.3
Livestock, equipment, crops	15.1	27.1	41.2	53.8	51.2
Financial assets[b]	5.0	18.3	20.2	21.2	21.9
Total	$53.7	$107.2	$136.7	$168.7	$165.4
Liabilities					
Real estate debt	$6.6	$4.8	$5.6	$6.6	$7.1
Commodity Credit Corp., nonrecourse loans	.4	.3	1.7	.6	1.2
Other non-real-estate debt	3.0	2.9	5.2	7.3	7.6
Proprietors' equities	43.7	99.2	124.2	154.2	149.5
Total	$53.7	$107.2	$136.7	$168.7	$165.4

From *The Balance Sheet of Agriculture, 1953* (Bureau of Agricultural Economics, September 1953), page 2. Amounts are given as of January 1.

[a] Preliminary.

[b] Includes deposits and currency, United States savings bonds, and investment in cooperatives.

estate, livestock, and crops resulted from the wartime rise in market prices rather than from an increase in actual physical assets. Physical assets in machinery, however, increased substantially; even after adjustment for price changes, the total value of equipment in 1953 was more than double the 1940 figure. And, of course, the increase in financial assets from $5.0 to $21.9 billion reflected actual dollar additions to total assets.

One outstanding feature of the war years, so far as the financial position of agriculture is concerned, has been the behavior of total farm mortgage debt in the United States. Credit was plentiful during and after World War II, with keen competition among lenders. Sales of farm land reached record volume, and there were signs of speculative activity in numerous resales following brief ownership. Farm real estate values rose steadily. By early 1946 the average value per acre was about 71 percent above the average for 1940. At the beginning of 1953 the average value was 154 percent above that of 1940 and 20 percent above the highest level of the World War I boom (Table 3 and Figure 2). Despite these developments, total farm mortgage debt declined from $6.6 billion as of January 1, 1940 to a low of $4.8 billion for 1946 (Table 4). Thereafter it increased to $7.1 billion for 1953. This is in sharp contrast with developments during and after World War I, when farm mortgage debt increased steadily from $5.0 billion in 1915 to a high of $10.8 billion in 1923 (Figure 4). Non-real-estate debt, however, reached a new high level after World War II. The volume of such debt owed to the principal lending institutions on January 1, 1953 was $4.2 billion, which compares with a previous record of $3.9 billion in 1921.[19]

As would be expected, distress transfers of farms decreased steadily as the financial position of agriculture improved. During 1939 distress transfers occurred at a rate of 12.6 per thousand farms in the United States; during each of the years 1945-52 the rate was less than 2 per thousand farms (Figure 2). This is the lowest level for such transfers during the period for which estimates are available, which extends back to 1912. It contrasts sharply with the peak of 38.8 distress transfers per thousand farms reached in 1932 and a yearly average of about 17 per thousand farms during the two decades from 1920 to 1940.

[19] *Agricultural Finance Review*, Vol. 15, Supplement May 1953, Table 23, p. 32.

TABLE 3

Index Numbers of Farm Real Estate Values per Acre, 1940, 1946, and 1953

(1912-14 = 100)

Region and state	*1940*	*1946*	*1953*	*Increase 1940-53*
The Northeast				
Maine	95	127	137	44%
New Hampshire	94	122	152	62
Vermont	101	144	196	94
Massachusetts	113	141	171	51
Rhode Island	120	159	203	69
Connecticut	124	166	213	72
New York	86	120	175	103
New Jersey	116	164	233	101
Pennsylvania	90	130	199	121
Appalachian states				
Delaware	89	136	199	124
Maryland	100	164	254	154
Virginia	112	200	310	177
West Virginia	85	122	165	94
North Carolina	138	265	446	223
Kentucky	113	219	330	192
Tennessee	108	212	321	197
Cotton Belt states				
South Carolina	89	172	249	180
Georgia	82	146	235	187
Alabama	122	205	337	176
Mississippi	106	195	320	202
Arkansas	95	178	302	218
Louisiana	121	175	264	118
Oklahoma	93	154	250	169
Texas	99	151	230	132
Florida	133	268	286	115
Corn Belt states				
Ohio	77	140	223	190
Indiana	74	145	232	214
Illinois	75	124	210	180
Iowa	74	121	188	154
Missouri	59	102	154	161

Region and state	*1940*	*1946*	*1953*	*Increase 1940-53*
Lake states				
Michigan	91	167	249	174%
Wisconsin	84	120	172	105
Minnesota	86	129	207	141
Great Plains and Mountain states				
North Dakota	52	84	146	181
South Dakota	41	66	122	198
Nebraska	58	96	169	191
Kansas	71	121	211	197
Montana	57	106	143	151
Idaho	93	166	172	85
Wyoming	74	148	223	201
Colorado	62	124	156	152
New Mexico	95	203	287	202
Arizona	107	209	281	163
Utah	74	113	132	78
Nevada	65	118	139	114
Pacific Coast states				
Washington	71	126	135	90
Oregon	73	125	130	78
California	106	222	209	97
United States	82	140	208	154

From *The Farm Real Estate Market* (Bureau of Agricultural Economics), July 1953, pages 22 f.; data as of March 1. Data for 1946 are from a September 1953 release by the BAE.

Financial Position of Agriculture, 1953

While total farm debt had increased nearly 100 percent by early 1953 from the low point reached in 1946, the amount of the debt was still less than 10 percent of the estimated value of total assets. As of January 1, 1953 the financial assets of farmers (deposits and currency, United States savings bonds, and investment in cooperatives) were estimated at more than one and one-third times the total of farm debt, whereas in 1940 such

TABLE 4

Farm Mortgage Debt, 1940, 1946, and 1953, and Non-real-estate Debt, 1943 and 1953

(dollar figures in millions)

Region and state	*Total farm mortgage debt*[a]			*Change*	*Non-real-estate debt*[c]		*Change*
	1940	1946	1953	1940-53[b]	1943	1953	1943-53[b]
The Northeast							
Maine	$24.8	$17.1	$22.6	−9%	$9.0	$18.2	102%
New Hampshire	11.2	10.6	21.5	91	2.1	4.3	106
Vermont	27.8	23.2	38.3	38	5.8	17.8	207
Massachusetts	45.8	35.0	47.1	3	2.9	8.4	184
Rhode Island	4.1	3.6	5.0	21	1.0	1.6	141
Connecticut	36.7	25.3	34.4	−6	3.3	10.7	226
New York	191.8	145.1	204.3	7	33.4	102.2	206
New Jersey	48.8	39.2	73.1	50	6.7	17.1	157
Pennsylvania	131.6	104.7	172.5	31	23.7	78.4	230
Appalachian states							
Delaware	8.0	6.0	11.3	42	1.6	5.3	228
Maryland[d]	46.7	39.6	70.7	51	6.4	22.3	249
Virginia	72.3	60.9	99.1	37	19.6	47.9	144
West Virginia	22.0	18.0	31.2	42	6.2	11.7	87
North Carolina	90.1	78.1	139.8	55	16.3	40.3	147
Kentucky	109.3	79.4	135.8	24	25.1	73.5	192
Tennessee	92.6	66.5	112.8	22	21.4	65.5	206
Cotton Belt states							
South Carolina	45.9	37.4	56.0	22	17.2	24.7	43
Georgia	82.0	69.4	133.2	62	35.8	61.8	72
Alabama	81.9	66.2	101.8	24	33.3	52.4	57
Mississippi	100.4	85.8	136.0	35	43.9	81.6	86
Arkansas	72.5	66.0	116.6	61	32.4	72.9	125
Louisiana	55.1	48.3	70.7	28	23.3	43.1	85
Oklahoma	153.7	108.0	157.1	2	50.8	125.3	147
Texas	431.7	313.7	525.9	22	155.4	385.9	148
Florida	38.1	30.9	113.5	198	17.2	45.5	165
Corn Belt states							
Ohio	239.1	167.2	289.4	21	39.0	109.2	180
Indiana	236.3	168.5	250.6	6	35.8	106.9	198
Illinois	419.0	251.6	316.4	−24	72.7	246.5	239
Iowa	705.6	476.2	521.0	−26	110.5	317.0	187
Missouri	229.4	184.1	220.2	−4	71.8	188.7	163

TABLE 4 (Concluded)

Region and state	Total farm mortgage debt[a]			Change	Non-real-estate debt[c]		Change
	1940	1946	1953	1940-53[b]	1943	1953	1943-53[b]
Lake states							
Michigan	$174.3	$139.4	$191.4	10%	$25.9	$82.5	218%
Wisconsin	356.9	245.7	326.6	—8	35.3	104.1	195
Minnesota	376.0	286.8	316.4	—16	73.3	178.0	143
Great Plains and Mountain states							
North Dakota	141.2	83.0	74.0	—48	61.5	58.1	—5
South Dakota	127.7	99.4	106.0	—17	70.7	93.3	32
Nebraska	309.8	181.9	186.8	—40	84.1	205.0	144
Kansas	284.2	151.5	183.7	—35	88.0	200.7	128
Montana	66.1	41.7	86.8	31	37.2	65.7	77
Idaho	78.8	56.2	107.9	37	19.5	60.8	211
Wyoming	34.0	24.3	53.9	58	22.0	43.5	98
Colorado	75.0	60.9	151.5	102	52.7	160.8	205
New Mexico	27.5	26.5	69.0	151	15.7	41.2	163
Arizona	28.9	23.0	49.7	72	12.2	62.3	410
Utah	36.6	26.2	52.5	43	17.1	44.7	162
Nevada	10.2	6.9	17.7	74	3.5	12.7	264
Pacific Coast states							
Washington	106.9	76.9	149.7	40	22.0	53.5	143
Oregon	90.4	71.6	155.4	72	14.6	58.7	303
California	407.6	333.0	633.6	55	93.6	313.0	234
United States	$6,586.4	$4,760.5	$7,140.5	8%	$1,672.5	$4,225.3	153%

Figures are given as of January 1.

[a] Data for 1940 are from Harold T. Lingard's *Farm-Mortgage Loans and Their Distribution by Lender Groups, 1940-48* (U.S. Department of Agriculture, Circular 812, August 1949), Table 30, page 49; data for 1946 and 1953 are from *Agricultural Finance Review* (Bureau of Agricultural Economics), Vol. 15, Supplement May 1953, pages 20 and 27.

[b] Percentage changes were calculated before rounding debt figures to the nearest 0.1 million.

[c] Non-real-estate debt includes that part held by banks and federal and federally sponsored agencies and excludes price support loans made or guaranteed by the Commodity Credit Corporation. Data for 1943 were supplied by the Federal Deposit Insurance Corporation, the Farm Credit Administration, and the Farmers Home Administration; data for 1953 are from *Agricultural Finance Review*, Vol. 15, Supplement May 1953, page 33.

[d] Includes District of Columbia.

items had amounted to only one-half the farm debt (Table 2). Farm debt increased further during 1953 but continued low in relation to the amount of assets owned by farmers.

Despite a relatively low total farm debt in the United States, however, substantial numbers of individual farmers are heavily indebted. In each year from March 1947 to March 1953 more than half of all farm sales involved credit financing.[20] In these credit sales as a whole the debt has averaged more than half the purchase price, and in a fifth of them it has amounted to 75 percent or more of the purchase price. The average size of new farm mortgage loans recorded in 1952 was $5,630, which compares with $2,370 in 1940.[21] No doubt many of the recent loans have been for amounts exceeding the prewar value of the farm.

Non-real-estate or short-term loans are another important part of the current farm debt picture. Such debt, excluding nonrecourse price support loans, increased from $2.9 to $7.6 billion between 1946 and 1953 to exceed the total farm real estate debt (Table 2). In periods of declining farm income, short-term loans are often the first to be called and become a direct source of financial distress. If they cannot be repaid, they are likely to be refunded into long-term mortgages, as frequently happened in the early twenties. Accordingly, if farm incomes should decline in the years ahead, short-term debt might require considerable refunding and in that way it could swell the outstanding volume of long-term credit.

As this is being written, in the fall of 1953, general economic activity remains high. But prices received by farmers for several important commodities have declined substantially from 1952 levels, and farm costs have decreased relatively little. Price-cost relationships are expected to continue less favorable in 1954, and the decline in agricultural prices currently is a subject of considerable concern to farm lenders. In some areas farmers are not repaying loans as quickly as expected and a few short-term loans have been refinanced with long-term farm mortgage loans. While the volume of actual debt distress is believed to be very small, the attitudes of both farmer and lender toward credit have become more cautious in recent months.

[20] *The Farm Real Estate Market* (Bureau of Agricultural Economics), July 1951, p. 7, and July 1953, pp. 13 f.

[21] *Farm Mortgages Recorded, 1944* (Farm Credit Administration), Table 10, p. 14; and *The Balance Sheet of Agriculture, 1953* (Bureau of Agricultural Economics, Agr. Inf. Bul. No. 115), p. 23.

Scope of the Study

The chapters that follow offer an analytical review of farm mortgage distress in the United States mainly during the interwar period. Extension of the analysis to earlier periods was virtually prohibited by the extreme sketchiness of the data prior to 1920. During World War II and the subsequent years there have been very few foreclosures or signs of farm financial distress. For that period the discussion will merely touch on the development of conditions that might lead to future distress.

The introductory historical survey has dealt with trends of prices and farm prosperity mainly for agriculture as a whole. The over-all trends, of course, result from conditions in highly disparate segments of the farm economy. Farm incomes were far from uniformly depressed during the years 1920-40. In some parts of the country a combination of low prices for the principal products and crop failures due to bad weather or other production hazards created serious financial distress. Some other areas encountered comparatively little difficulty. And even within relatively small type-of-farming areas there were substantial variations in individual farm incomes and financial distress. Hereafter attention will be concentrated for the most part on these variations in farm mortgage distress—both among geographical areas and among individual farms.

Anyone familiar with agriculture is well aware that the factors associated with success and failure are many and varied. Some are based on the physical characteristics of a region and the economic characteristics of its principal products. Others are closely related to the individual farmer and his farm—local soil conditions, size and organization of the farm business, extent of debt, and the capabilities of the farmer and his family. It has seemed desirable, therefore, from the standpoints of both analysis and presentation to divide the book into two parts, the first entitled "The Economic Geography of Farm Mortgage Distress," and the second, "Farm Mortgage Distress and Individual Farm Organization."

In Part I, which is concerned with geographical variations, the first task is to locate the conspicuous mortgage trouble spots of the interwar period as well as the principal areas where mortgage experience was substantially better than average. This is done mainly through maps showing state and county differences in the rate of distress transfers of farms and in the loan experi-

ence of land banks and insurance companies, with correlative information on land values, bank deposits, and other pertinent factors. Still more important than the location of the mortgage trouble spots is the identification of the basic economic and climatological factors that appear responsible. Most of Part I is devoted to analyzing causes of mortgage distress in such major farming areas as the Corn Belt, the Cotton Belt, and the Great Plains.

Part II deals with variations among individual farm businesses within a single region or type-of-farming area and their relation to differences in debt carrying capacity and mortgage experience. Principal consideration is given to physical variations that affect farm productivity, and to financial variations in the organization of the farm business.

PART I

THE ECONOMIC GEOGRAPHY OF FARM MORTGAGE DISTRESS

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LOCATION OF AREAS OF FARM MORTGAGE DISTRESS

THE main purpose of Part I is to describe geographical variations in farm mortgage distress between 1920 and 1940 and to relate the observed variations to general economic conditions in different farming areas and to those characteristics of agriculture, such as type of farming, soil, topography, climate, and location relative to markets, that affect farm earnings. Chapter 1 takes up the problem of locating and mapping areas where distress was either unusually heavy or notably less severe than elsewhere. Later chapters will deal specifically with the mortgage experience in major agricultural areas, relating it to general economic conditions and the physical factors affecting productivity.

Indicators of Farm Mortgage Distress

In the broadest sense farm mortgage distress means much more than foreclosure or forced sale. Sometimes mortgage distress is evidenced by nothing more than mortgage delinquency, without actual loss of the farm pledged as security. There may even be distress without delinquency, appearing in the form of lowered family living standards or badly run-down land and buildings. Farmers have often had to "mine" their soil in order to pay their mortgages. In our analysis, however, the chief emphasis will be on those forms of distress evidenced by loss of farm through bankruptcy, foreclosure, or assignment to creditors in lieu of foreclosure, though other economic manifestations of distress will be mentioned.

The several indicators to be used in locating agricultural areas relatively subject to or free from debt difficulties are: (1) records of distress transfers of farms, available for all states and also for a 485-county sample taken throughout the country and compiled by the Bureau of Agricultural Economics under a Works Progress Administration project; (2) farm mortgage foreclosures and losses reported by the federal land banks, the Federal Farm Mortgage Corporation, and several of the major insurance companies; (3) the number of commercial bank

failures and the rate of decline in bank deposits; and (4) trends in farm real estate values.

These data are diverse, which is a disadvantage in the sense that there seems to be no feasible method of combining them into an index of farm mortgage distress by counties, or even by groups of counties. But the diversity is also an advantage because it provides broad evidence concerning farm economic conditions. The loan experience of individual institutional lenders is not necessarily representative of all lenders, nor is it necessarily an accurate measure of the extent of farm mortgage distress in an area. With several types of data, however, it is possible to develop a reasonably good picture of farm mortgage experience in various parts of the United States during the interwar period.

Distress Transfers of Farms

The record of distress transfers is probably the most comprehensive single source of information concerning farm mortgage difficulty. In the first place, these transfers include assignments to creditors in lieu of foreclosure as well as actual foreclosures and bankruptcies. In the second place, the record covers all types of lenders, including individuals. Thus it contributes greatly to the picture of debt distress in areas where the loans of banks, insurance companies, and federal land banks were relatively few.

The United States Department of Agriculture has compiled, by states, annual distress transfer rates (distress transfers per thousand farms) for 1925 and subsequent years.[1] The data, to be sure, have two obvious shortcomings: they do not cover the early twenties, when considerable distress occurred in some parts of the country; and the statewide units in which they are available are often too large to show important geographical variations. Despite their weaknesses, the statewide distress transfer rates provide worthwhile information concerning trends in, and the location of, farm mortgage distress during most of the

[1] These materials are published, usually every other year, in *The Farm Real Estate Situation*. The issues used for Figures 6 and 7, identified by USDA publication number and the years for which distress transfers are reported, are: Circular No. 150 (1925-29), No. 309 (1929-32), No. 354 (1934), No. 548 (1934-38), and No. 662 (1937-41).

The reporting years used by the Department of Agriculture end on March 15. Thus the year referred to as 1925 is the twelve-month period ending March 15, 1926, and the period referred to as 1925-39 extends from March 16, 1925 through March 15, 1940.

interwar period. For example, the annual averages for 1925-39 give a broad, general picture of geographical variations (Figure 6).

A further use of the statewide distress transfer rates is possible because they can be adjusted somewhat for variations in the ratio of mortgaged farms to total farms that occurred from state to state. Figure 7 shows estimated annual average distress transfers, 1925-34, per thousand mortgaged farms.[2] The adjusted distress transfer rates imply somewhat worse experience in certain sections of the country than do the unadjusted rates. This tendency is particularly noticeable in the Southeast, where the ratio of mortgaged farms to total farms is low—largely because of the census practice of counting cropper units as whole farms. Since cropper units would not ordinarily be considered as whole farms, the adjusted transfer rates undoubtedly give a more accurate picture of mortgage conditions in the Southeast than do the unadjusted rates. For other parts of the country, the superiority of either set of distress transfer rates over the other depends on point of view. If, for example, the emphasis is upon the proportion of farmers who had financial difficulties in a given state, the unadjusted rates are probably superior. If, however, the emphasis is upon the amount of difficulty experienced by lenders, the adjusted rates are probably better.

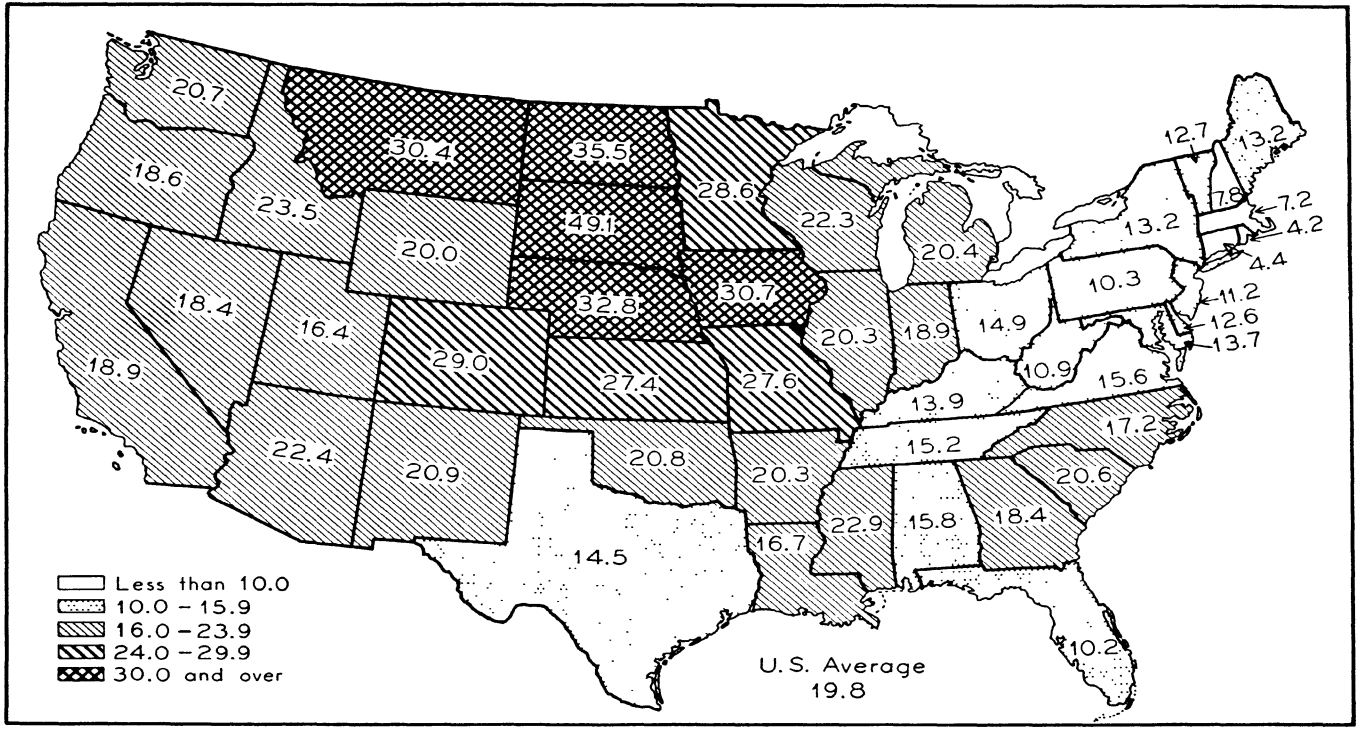
Distress transfers were also tabulated under a Works Progress Administration project from official records in 485 selected counties.[3] The period covered is 1935 and earlier years, and in some counties records go back to 1900. In later chapters these data will be used to show the trend of distress after 1900 in selected areas. For the present purpose of locating trouble spots, the number of distress transfers during 1920-35 expressed as a percentage of the estimated number of *mortgaged* farms in 1930 is the measure used, because of its greater accuracy for the Southeast and thus for regional comparisons.[4] Variations in dis-

[2] The estimates were obtained by dividing the annual average number of distress transfers per thousand farms in 1925-34 by the estimated ratio of mortgaged farms to total farms in 1930. The ratios of mortgaged farms to total farms for each state, which are available only at five-year intervals beginning with 1930, are contained in *Farm-Mortgage Debt in the United States: 1945*, a cooperative report by the Bureau of the Census and the Bureau of Agricultural Economics, Table 2, page 6.

[3] See *Transfers of Farm Real Estate* (Bureau of Agricultural Economics, mimeo., August 1939).

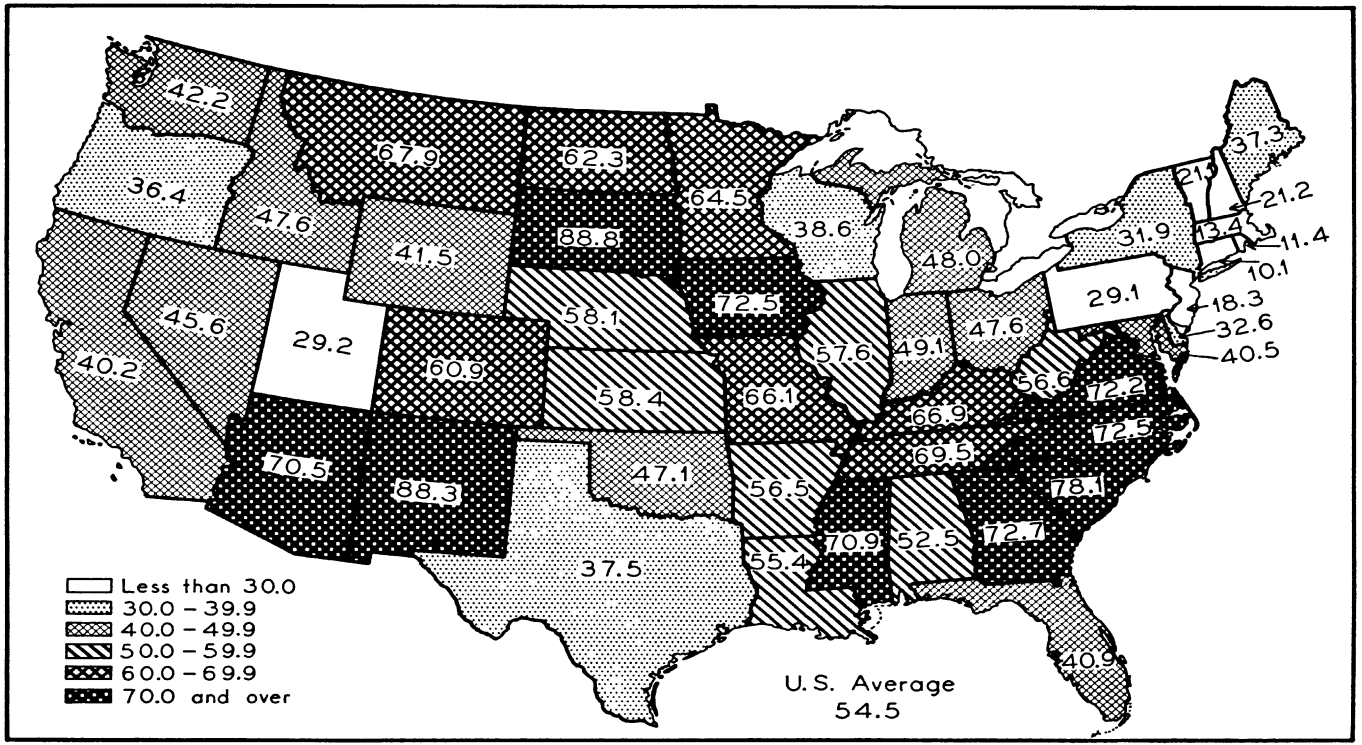
[4] Information on the total number of mortgaged farms by counties was not directly available and had to be estimated. The 1930 Census of Agriculture gives

Figure 6. Average Annual Distress Transfers per Thousand Farms, 1925-39



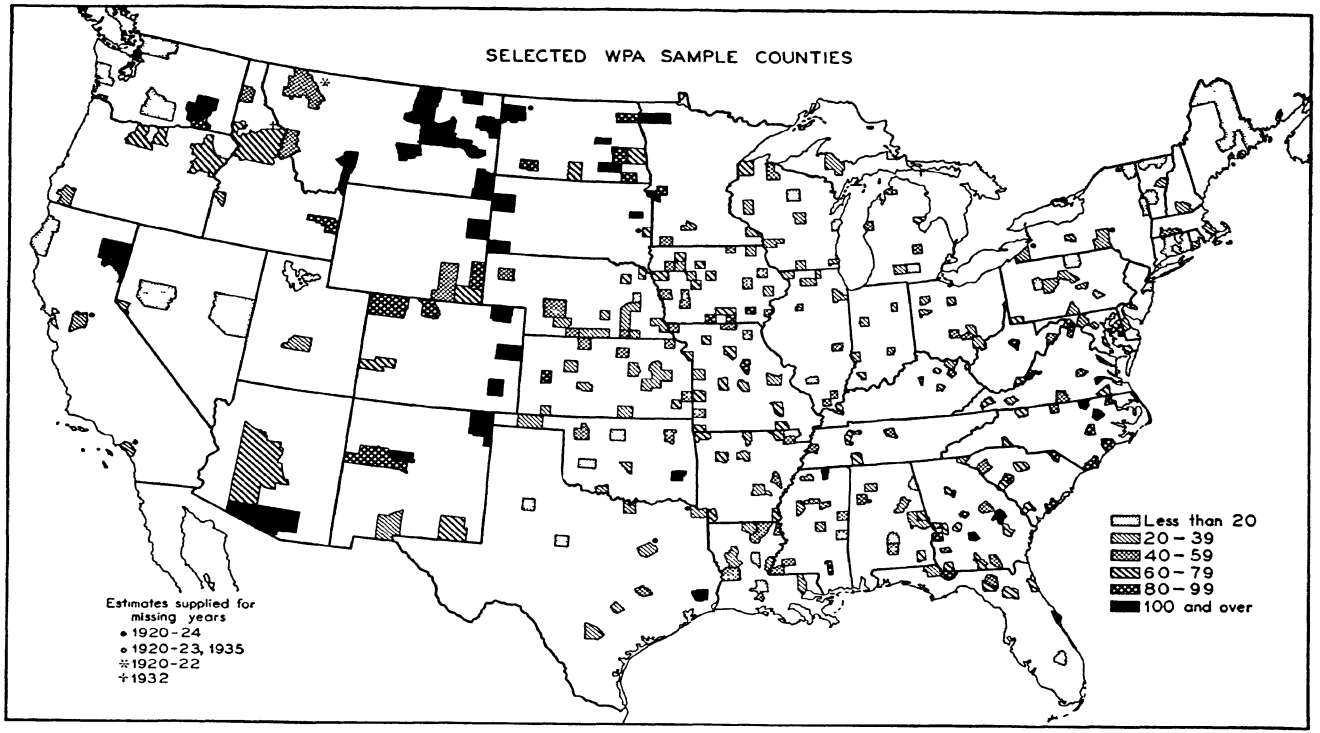
Distress transfers include foreclosures, and assignments to avoid foreclosure. Data are from **The Farm Real Estate Situation**, cited in footnote 1 of this chapter. Based on census figures, cropper units being counted as separate farms; see page 27.

Figure 7. Average Annual Distress Transfers, 1925-34, per Thousand Mortgaged Farms in 1930



Distress transfers (i.e., foreclosures, and assignments to avoid foreclosure) annually per thousand farms, from census data, are given in **The Farm Real Estate Situation,** cited in footnote 1. Ratios of mortgaged farms to all farms were taken from **Mortgage Debt in the United States: 1945**; see footnote 2.

Figure 8. Distress Transfers, 1920-35, per Hundred Mortgaged Farms in 1930



Data on distress transfers (i.e., foreclosures, and assignments to avoid foreclosure) are from **Transfers of Farm Real Estate** (BAE, 1939) and are described in the accompanying text. For comment on 1930 as base year, and other details, see footnote 4.

tress among the WPA sample counties are shown on that basis in Figure 8. The map covers all counties for which distress transfers were listed for every year from 1920 to 1935, inclusive, and a few additional counties for which missing years could easily be estimated.

Experience with Federal Land Bank Loans

Frequently it will be convenient to refer to the twelve federal land banks merely as "land banks." The abbreviated term will be applied only to them and will not include the so-called joint stock land banks, which were established along with the federal land banks under authority of the Federal Farm Loan Act of 1916 but were later liquidated by the Emergency Farm Mortgage Act of 1933.

The federal land banks started operations in 1917 with initial capital entirely subscribed by the United States government. Since they started in a period when credit from other sources was comparatively easy to obtain, the volume of their loans grew slowly, by the end of 1920 amounting only to $356 million, or 3½ percent of the total farm mortgage debt. With the tightening of credit from other sources after 1920, the volume of land bank loans grew more rapidly; by the beginning of 1927

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county data on the number of owner-operated farms mortgaged. Also available were statewide estimates, made by the Bureau of Agricultural Economics, of the percent of tenant- or manager-operated farms mortgaged as well as the percent of owner-operated farms mortgaged. From the combined information the percent (X) of tenant- or manager-operated farms mortgaged in each county was estimated by means of the proportion

$$\frac{X}{\%\text{ owner-operated farms mortgaged in county}} = \frac{\%\text{ tenant- or manager-operated farms mortgaged in state}}{\%\text{ owner-operated farms mortgaged in state}}$$

Adding, for each county, the number of tenant- or manager-operated farms mortgaged (X percent of all farms) to the number of owner-operated farms mortgaged gave the estimate for the total number of farms mortgaged in the county.

While regional comparability is improved (through more accurate representation of the Southeast) by expressing distress transfers as a percentage of mortgaged farms rather than of all farms, some noncomparability may nevertheless be involved in using 1930 as the base year. In areas such as the western Great Plains, where a substantial proportion of the 1920-35 foreclosures occurred before 1930 and thereby reduced the number of mortgaged farms in that year, the rate of foreclosures would tend to be overstated in comparison with areas where the majority of foreclosures occurred after 1930.

it aggregated slightly more than a billion dollars.[5] Meanwhile most of the capital originally subscribed by the government had been paid back by farmer-borrowers who became stockholders in the system, which is cooperative in character.[6]

In the early thirties, when economic conditions became critical, the lending operations of the land banks were very substantially curtailed by a shortage of loan funds that arose because certain classes of distressed assets, including acquired real estate, were not eligible as security for land bank bonds. Since the volume of real estate acquisitions was rapidly increasing (the land banks acquired an average of roughly 9,000 farms a year from 1932 to the end of the decade), it constituted a large and continuing drain on resources available for lending. To meet this situation the government subscribed additional capital, which permitted the banks not only to grant extensions of time to deserving borrowers but also to undertake extensive farm debt refinancing operations. In addition the land banks became agents for direct governmental mortgage loans of an emergency type known as Land Bank Commissioner loans. By 1937 land bank and Commissioner loans amounted to $2,889 million and constituted 39 percent of the total farm mortgage debt.[7]

As farm incomes increased during World War II, mortgage loan deliquencies and distress transfers of farm real estate declined sharply. Farmers began to repay their loans at a greatly increased rate and the financial position of the land banks rapidly improved. In the fiscal year ending June 30, 1947 the last government capital was repaid and the banks became wholly farmer-owned cooperative credit institutions.

Since the land banks loaned widely throughout the United States, the geographical variations in their loan experience are an important indicator of areas of farm mortgage distress. A useful measure of where borrowers had difficulty is the "mortality rate" of loans: that is, the percentage ratio of the volume of real estate acquisitions and charge-offs within a certain group

[5] Donald C. Horton, Harald C. Larsen, and Norman J. Wall, *Farm-Mortgage Credit Facilities in the United States* (U.S. Department of Agriculture, Misc. Pub. No. 478, 1942), Table 2, p. 12.

[6] In contrast to the federal land banks, the joint stock land banks had capital originally provided by private subscription. Thus two types of land bank were established under the Federal Farm Loan Act, one proprietary and the other cooperative.

[7] Horton, Larsen, and Wall, *op.cit.*, Table 2, p. 12.

of loans to the total original amount of the loans. The Farm Credit Administration has compiled information by county on the amount of acquisitions (whether by foreclosure or by voluntary deed), together with charge-offs, to 1939 or later for all land bank loans made between 1917 and 1933.[8] Mortality rates, calculated for groups of adjoining counties which in general have similar physical, climatic, and type-of-farming characteristics, are shown in Figure 9.

As a measure of where lenders had difficulty, loss rates serve better than mortality rates. County to county variations in loss rates on land bank loans made before 1933 may be observed in Figure 10. The areas of high mortality rates have also been, on the whole, areas of high loss rates, but the correspondence is not perfect. Losses are not necessarily proportional to the volume of acquisitions (in which both foreclosed farms and farms acquired by voluntary deed are included). Some acquisitions eventually result in large losses, but others may result in no loss at all or in gains. Actual loss experience is influenced by such factors as practice in making and foreclosing loans, the amount spent in acquiring, maintaining, and disposing of properties, and the time of acquisition and sale in relation to trends in the farm real estate market. The countrywide loss rate through June 1946 on land bank loans made from 1917 to 1933 was 7.1 percent (Table 5). Among states the range was from no loss in Rhode Island to 26.1 percent in Wisconsin.

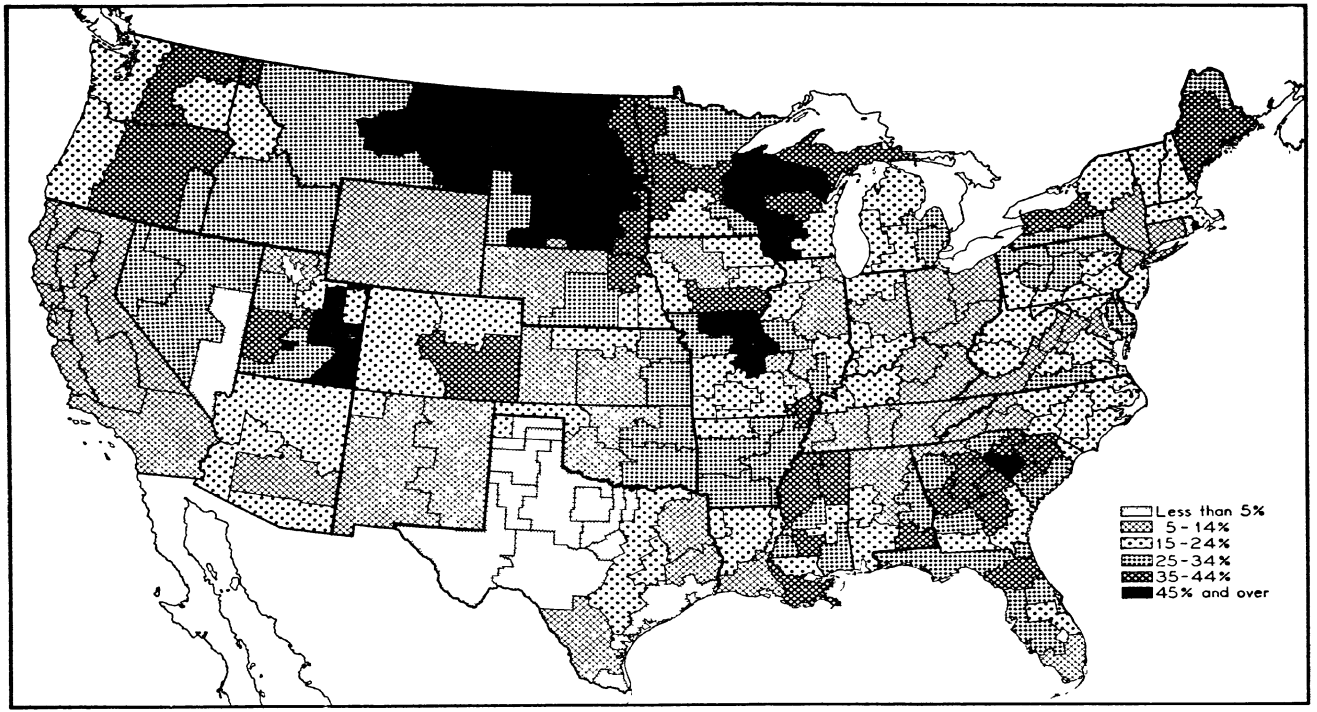
Experience with Land Bank Commissioner Loans

Land Bank Commissioner loans, because they first became available in 1933, when the usual credit sources were drastically curtailed, afford a unique chance to assess variations in experience on loans made in the worst part of the depression. Commissioner loans, which were direct financing by the federal government through the agency of the land banks,[9] could be made on first or second farm mortgage security, whereas regular land bank loans were restricted to first mortgages. Except for a con-

[8] In reporting acquisitions and charge-offs, two banks had cut-off dates in 1939, two in 1941, one in 1942, one in 1943, and the remaining six in 1946. Foreclosures after 1939 on loans made before 1933 were relatively few and would not affect the mortality rates significantly.

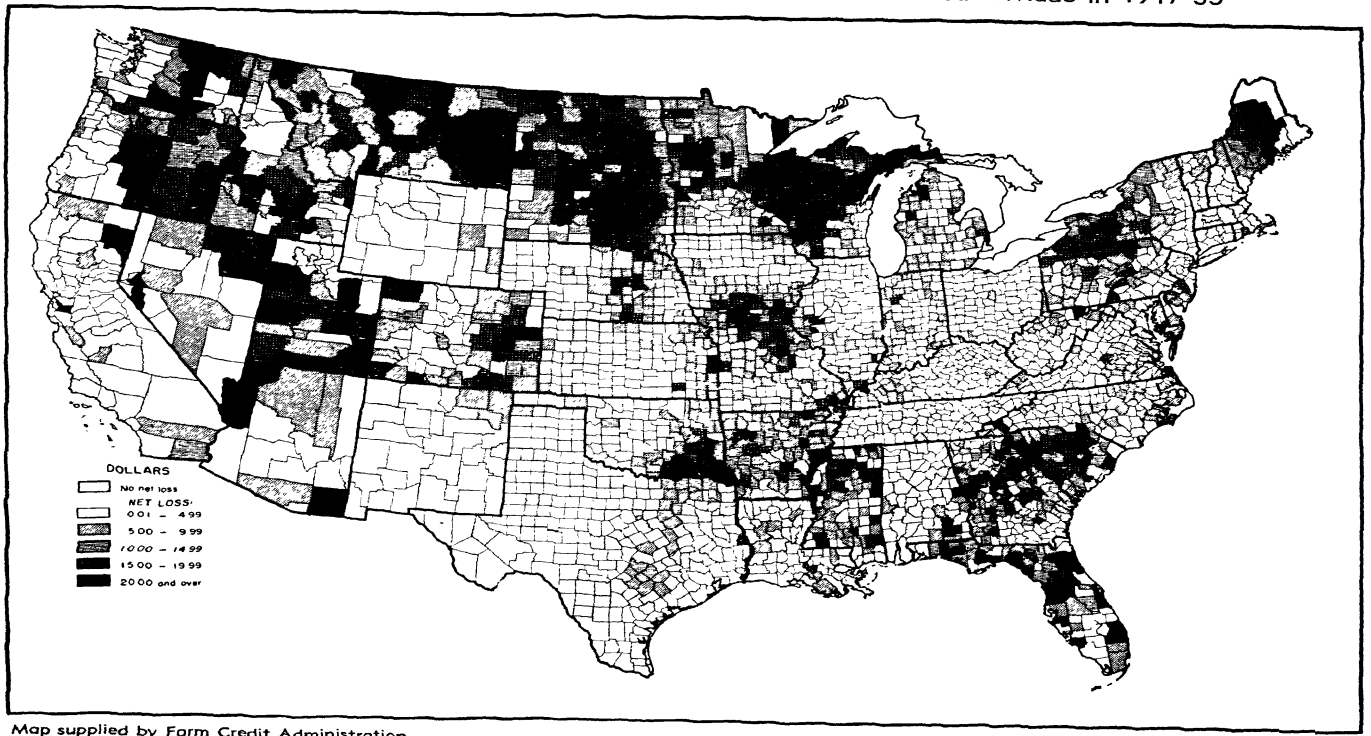
[9] The Federal Farm Mortgage Corporation, wholly owned by the government, was created in 1934 to provide funds for making Land Bank Commissioner loans by the sale of government-guaranteed bonds. Commissioner loans previously made were taken over by the corporation. Since July 1, 1947 no new Commissioner loans have been made.

Figure 9. Mortality Rates, 1917 to 1939-46, for Federal Land Bank Loans Made in 1917-33



Data supplied by Farm Credit Administration.
Mortality rates are real estate acquired and loan balances charged off up to dates ranging between 1939 and 1946 for the twelve banks, expressed as a percentage of amount loaned up to May 1933, for groups of counties with similar characteristics; see footnote 8 and text preceding it.

Figure 10. Net Loss, 1917-45, per $100 of Federal Land Bank Loans Made in 1917-33



Map supplied by Farm Credit Administration.
Losses on all loans made up to May 1933 are registered through June 30, 1945 for all districts except Springfield (period ends three months later) and Omaha (period runs from January 1, 1935 through June 30, 1945, covering about 75 percent of all losses).

TABLE 5

Loss Rates through June 1946 on Federal Land Bank Loans Made in 1917-33

Region and state	Loss rate[a]	Region and state	Loss rate[a]
The Northeast		*Corn Belt states*	
Maine	9.8%	Ohio	1.0%
New Hampshire	1.6	Indiana	4.0
Vermont	4.8	Illinois	2.0
Massachusetts	1.3	Iowa	4.6[c]
Rhode Island	[b]	Missouri	10.1
Connecticut	.5	*Lake states*	
New York	10.2	Michigan	9.6
New Jersey	4.0	Wisconsin	26.1
Pennsylvania	9.1	Minnesota	11.0
Appalachian states		*Great Plains and Mounain states*	
Delaware	3.7	North Dakota	25.3
Maryland	2.4	South Dakota	18.2[c]
Virginia	3.7	Nebraska	6.2[c]
West Virginia	3.5	Kansas	2.6
North Carolina	3.7	Montana	23.5
Kentucky	2.2	Idaho	8.6
Tennessee	1.4	Wyoming	1.0[c]
Cotton Belt states		Colorado	9.7
South Carolina	17.5	New Mexico	2.5
Georgia	10.9	Arizona	.4
Alabama	3.6	Utah	8.7
Mississippi	10.3	Nevada	14.4
Arkansas	11.8	*Pacific Coast states*	
Louisiana	1.6	Washington	10.7
Oklahoma	4.9	Oregon	8.8
Texas	1.9	California	2.5
Florida	16.2	United States	7.1%

From special tabulations of the Farm Credit Administration.

[a] Losses through June 30, 1946 on all federal land bank loans made from 1917 through May 1933, as a percentage of the amount loaned.

[b] In Rhode Island there was a gain of 0.3 percent.

[c] Losses are for the period January 1, 1935 through June 30, 1946.

siderable number of good "prudent investment" loans made on part-time farms in certain areas, the Commissioner first mortgages were largely concentrated in situations considered too risky for federal land bank loans. The Commissioner second mortgages, which were usually junior to land bank first mortgages, were made on better land meeting the higher requirements of the land banks. For both first and second mortgages,

the total amount loaned, together with the prior lien in the case of a second mortgage, could be as much as 75 percent of the appraised normal value of the property (while regular land bank loans were limited to about 50 percent). There was a limit, first put at $5,000 and later at $7,500, on individual loans.

Since Commissioner loans were made on a second mortgage basis and on comparatively risky first mortgage security, they tended to bulk large in areas of distress and areas where other sources of loans were limited. Although many of the Land Bank Commissioner loans soon ran into repayment difficulties, it was the government's policy to make every effort to avoid actual foreclosures, and from 1933 through 1935 there were very few. In 1936 the investment in farm real estate acquired by the Commissioner increased somewhat and was equal to 1.3 percent of the amount of loans outstanding at the beginning of the year.[10] By 1939 the acquisition rate had increased to 4.5 percent. In 1940 acquisitions declined but still amounted to 2.8 percent of loans outstanding at the beginning of the year.

Loss rates on first mortgage Land Bank Commissioner loans made from 1933 through 1935 are given by state in Table 6. The loans reported on, made when the refinancing program was most active, represent about three-fourths of the $419 million total of Commissioner first mortgage loans made from 1933 through mid-1946. Figure 11 shows county variations in loss rates on a special group of the loans covered by Table 6: those whose amounts exceeded 65 percent of the appraised normal agricultural value of the farm. The pattern of distress is similar to that for the regular land bank loans, except for two notable differences: (1) heavier Commissioner losses in the dust bowl areas of western Kansas and adjoining states, and (2) smaller Commissioner losses in areas of the Far West lying between the two great mountain ranges, particularly in Idaho, Nevada, Arizona, and the eastern half of Washington and Oregon.

Experience with Loans by Life Insurance Companies

Insurance companies have long been lenders in the farm mortgage field and before the twenties were second in importance only to commercial banks. After 1910, loans of insurance companies increased at about the same rate as the farm mortgage

[10] Horton, Larsen, and Wall, *op.cit.*, Table 42, p. 121.

TABLE 6

Loss Rates through June 1946 on Land Bank Commissioner First Mortgage Loans Made in 1933-35

Region and state	*Loss rate*[a]	*Region and state*	*Loss rate*[a]
The Northeast		*Corn Belt states*	
Maine	19.4%	Ohio	.6%
New Hampshire	1.2	Indiana	.3
Vermont	.2	Illinois	.7
Massachusetts	2.4	Iowa	3.3
Rhode Island	0.0	Missouri	3.6
Connecticut	.6	*Lake states*	
New York	3.0	Michigan	2.2
New Jersey	2.0	Wisconsin	13.1
Pennsylvania	3.1	Minnesota	9.9
Appalachian states		*Great Plains and Mountain states*	
Delaware	3.6	North Dakota	17.6
Maryland	3.3	South Dakota	22.4
Virginia	1.3	Nebraska	8.7
West Virginia	1.0	Kansas	8.4
North Carolina	.5	Montana	4.1
Kentucky	.9	Idaho	1.1
Tennessee	.4	Wyoming	1.7
Cotton Belt states		Colorado	10.0
South Carolina	4.0	New Mexico	1.5
Georgia	1.8	Arizona	[b]
Alabama	.6	Utah	3.6
Mississippi	1.7	Nevada	5.4
Arkansas	1.6	*Pacific Coast states*	
Louisiana	.6	Washington	1.8
Oklahoma	2.9	Oregon	1.0
Texas	1.3	California	1.0
Florida	4.7	United States	4.7%

From special tabulations of the Farm Credit Administration.

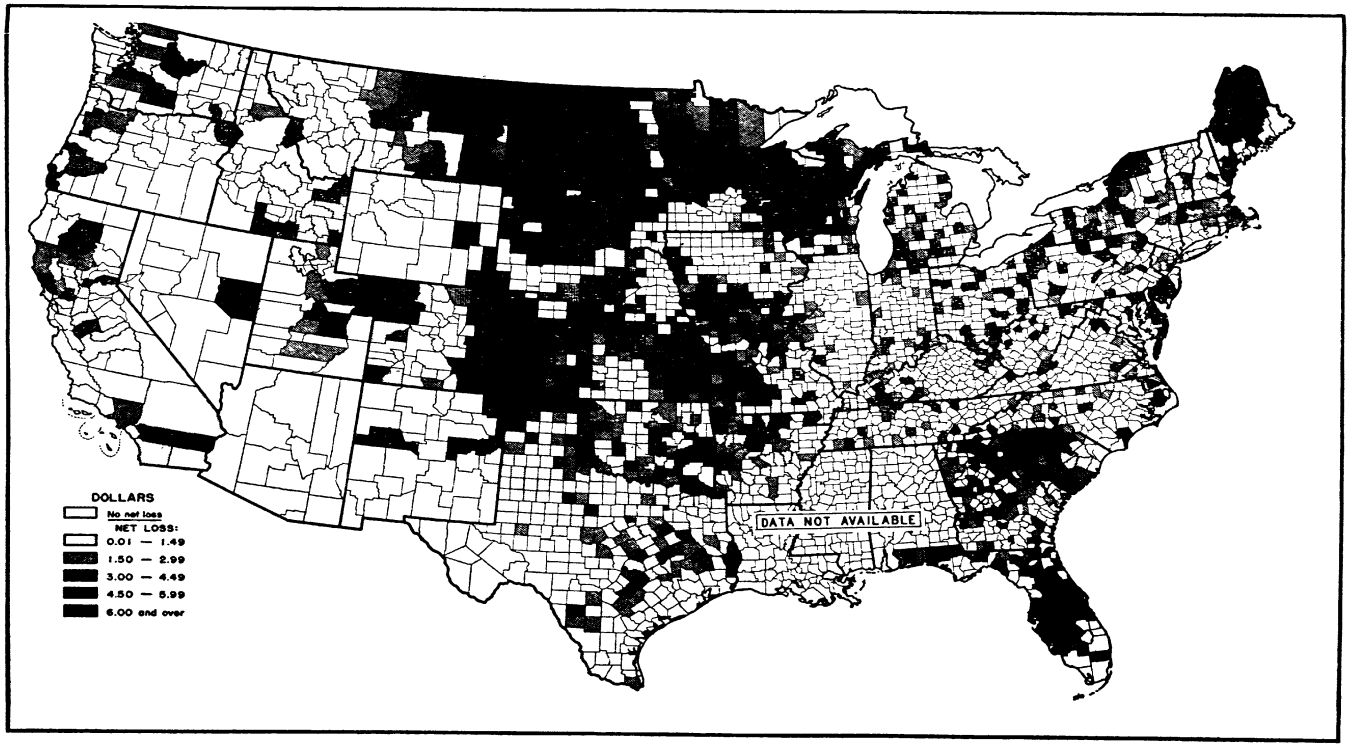
[a] Losses through June 30, 1946 on all Land Bank Commissioner first mortgage loans closed from May 1933 through December 1935, as a percentage of the total amount of the loans.

[b] Less than 0.05 percent gain.

loans made by commercial banks, and by the end of 1920 they totaled $1,206 million, or 12 percent of the total farm mortgage debt.[11] Insurance companies undoubtedly had losses in the agricultural depression of 1921, although little information about them is available. On the whole, however, their activities in the farm lending business at that time were much more suc-

[11] *Ibid.*, Table 2, p. 12.

Figure 11. Net Loss, to Mid-1945, per $100 of Land Bank Commissioner Loans Made in 1933-35



Map supplied by Farm Credit Administration.
Loans based on prudent investment values are excluded; the data cover only first mortgage loans whose amount exceeded 65 percent of the appraised normal agricultural value of the farm. Losses are registered through June 30, 1945 (for the Springfield district, through September 30).

cessful than those of commercial banks. After 1920, loans of insurance companies continued to expand and by the end of the decade their outstandings had about doubled. In the thirties, when the depression became especially severe, insurance companies foreclosed a large volume of their loans, and many of the remaining loans were refinanced by the land banks and the Land Bank Commissioner. Between 1929 and the end of 1937 insurance company farm mortgage holdings were reduced from $2,139 million to $895 million, mainly as a result of foreclosures and refinancing.

Because of the importance of insurance companies as lenders their foreclosure experience is significant in the over-all picture of farm mortgage distress. But the farm real estate loans of these companies were not so widespread geographically as the loans of commercial banks or of the federal land banks. The insurance companies tended to concentrate their business in the Middle West, where a substantial volume of above-average-sized loans could be made. At the beginning of 1930 the farm mortgage loans held by insurance companies amounted to 22 percent of the total farm mortgage debt of the United States, but the proportion varied widely in different parts of the country, from practically no loans in the northeastern states to over 35 percent of all mortgage loans in several of the midwestern states (Table 7).

Unpublished data showing farm mortgage lending experience by counties as of the end of 1929 have been provided by fourteen major insurance companies and as of the end of 1932 by fifteen companies. The farm mortgage loans held by these companies amounted to about 60 percent of the total of such loans held by all life insurance companies on the dates of report.

Areas where borrowers had difficulty can be located from the insurance company data by means of a "distressed asset ratio," which is the percentage ratio of pending plus completed foreclosures to total farm investment as of a given date. County to county variations in the distressed asset ratios of reporting companies are shown in Figure 12 for the end of 1929 and in Figure 13 for the end of 1932.[12] The 1929 map is significant because

[12] In the construction of the maps drawn from life insurance company data some cognizance had to be taken of counties where the number of loans was small. As a rule, counties with only one loan were eliminated entirely. Counties with, say, two to ten loans were also eliminated unless they could be consolidated with contiguous counties having about the same number. Thus in peripheral areas, where loan volume was often small, the maps show experience by groups

TABLE 7

Share of Total Farm Mortgage Debt Held by Life Insurance Companies, 1930

Region and state	Share of total farm mortgage debt	Region and state	Share of total farm mortgage debt
The Northeast		*Corn Belt states*	
Maine	[a]	Ohio	21.7%
New Hampshire	0.0%	Indiana	36.7
Vermont	[a]	Illinois	29.6
Massachusetts	[a]	Iowa	41.9
Rhode Island	0.0	Missouri	32.9
Connecticut	[a]	*Lake states*	
New York	.1	Michigan	3.7
New Jersey	.4	Wisconsin	4.6
Pennsylvania	[a]	Minnesota	29.2
Appalachian states		*Great Plains and Mountain states*	
Delaware	.5	North Dakota	14.2
Maryland[b]	1.4	South Dakota	39.2
Virginia	7.8	Nebraska	28.7
West Virginia	1.8	Kansas	36.5
North Carolina	10.9	Montana	8.6
Kentucky	22.7	Idaho	12.2
Tennessee	33.0	Wyoming	1.1
Cotton Belt states		Colorado	5.0
South Carolina	10.1	New Mexico	10.6
Georgia	25.5	Arizona	5.2
Alabama	9.1	Utah	3.5
Mississippi	21.1	Nevada	3.1
Arkansas	16.4	*Pacific Coast states*	
Louisiana	14.1	Washington	15.2
Oklahoma	26.2	Oregon	10.4
Texas	24.0	California	3.7
Florida	4.4	United States	22.0%

From *Distribution by Lender Groups of Farm-Mortgage and Real Estate Holdings, January 1, 1930-45*, by Harald C. Larsen (Bureau of Agricultural Economics, mimeo., August 1945), Tables 17 and 22, pages 60 and 68. Based on data as of January 1.

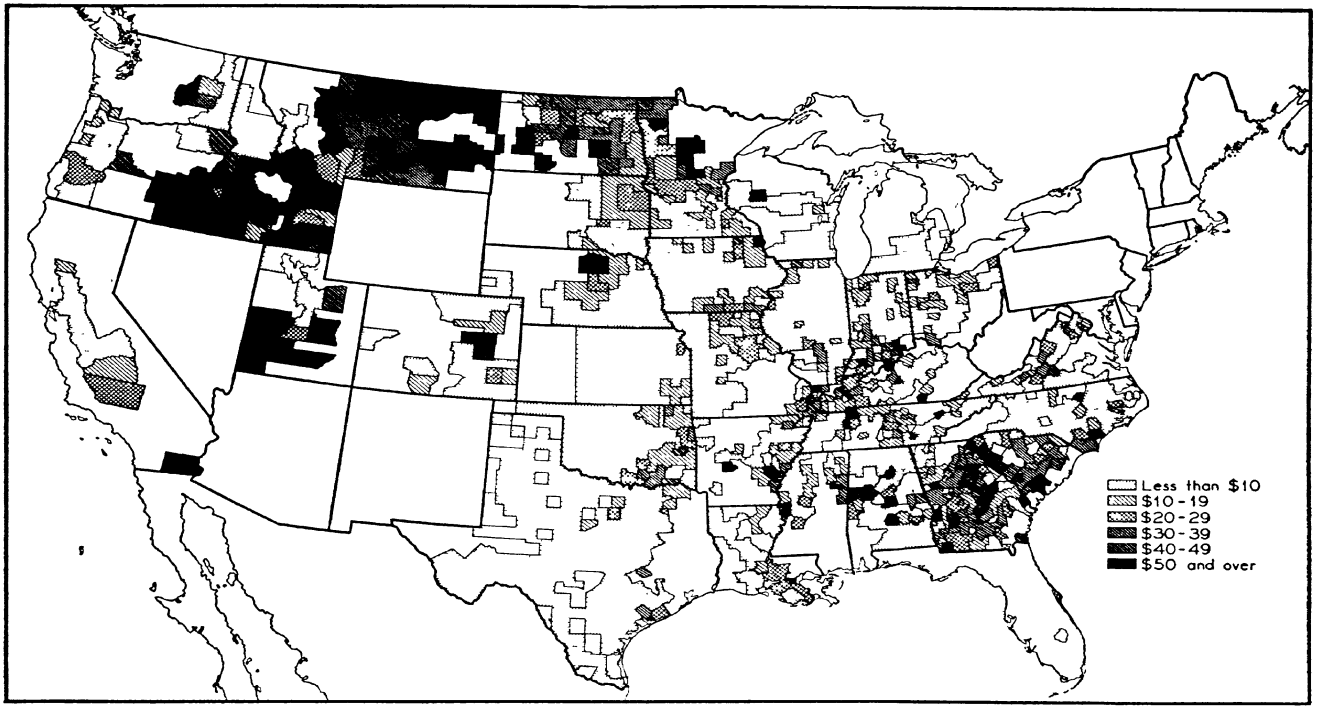
[a] Less than 0.05 percent.

[b] Includes District of Columbia.

it shows areas where distress developed early in the interwar period. Among them are a section of the eastern Cotton Belt and a strip of territory running west from northwestern Minnesota

of counties rather than individual counties. Counties with few loans were never consolidated with counties having numerous loans.

Figure 12. Distressed Assets per $100 of Farm Investment by 14 Life Insurance Companies, 1929



From unpublished data supplied by major life insurance companies. For areas shown in white, few or no loans were reported. See accompanying text and footnote 12.
Distressed assets, given as of December 31, 1929, include investment in farm loans under foreclosure, in farms acquired by deed or foreclosure, and in previously acquired farms sold with title retained. Total farm investment includes the foregoing as well as investment in farm loans not under foreclosure.

through North Dakota, Montana, Idaho, and eastern Oregon. By the end of 1932, when economic conditions were approaching their worst, the volume of pending and completed farm mortgage foreclosures had increased substantially. At that time one-fourth of the total farm investment of the reporting companies was in acquired farms and in loans under foreclosure.

On the extent to which foreclosures resulted in loss to the lender, the material provided by life insurance companies concerns recovery experience with acquired farms sold by thirteen firms from 1929 to 1937 inclusive. For the United States as a whole, receipts from sales amounted to 90.4 percent of total costs to date of sale, indicating a loss rate of 9.6 percent on the reporting companies' investment in acquired farms. Their experience, however, varied considerably from that average in individual states and counties. Discussion of the variations in loss rates will be deferred until Chapters 3 and 4, which deal with some of the areas where the insurance companies were especially active lenders.

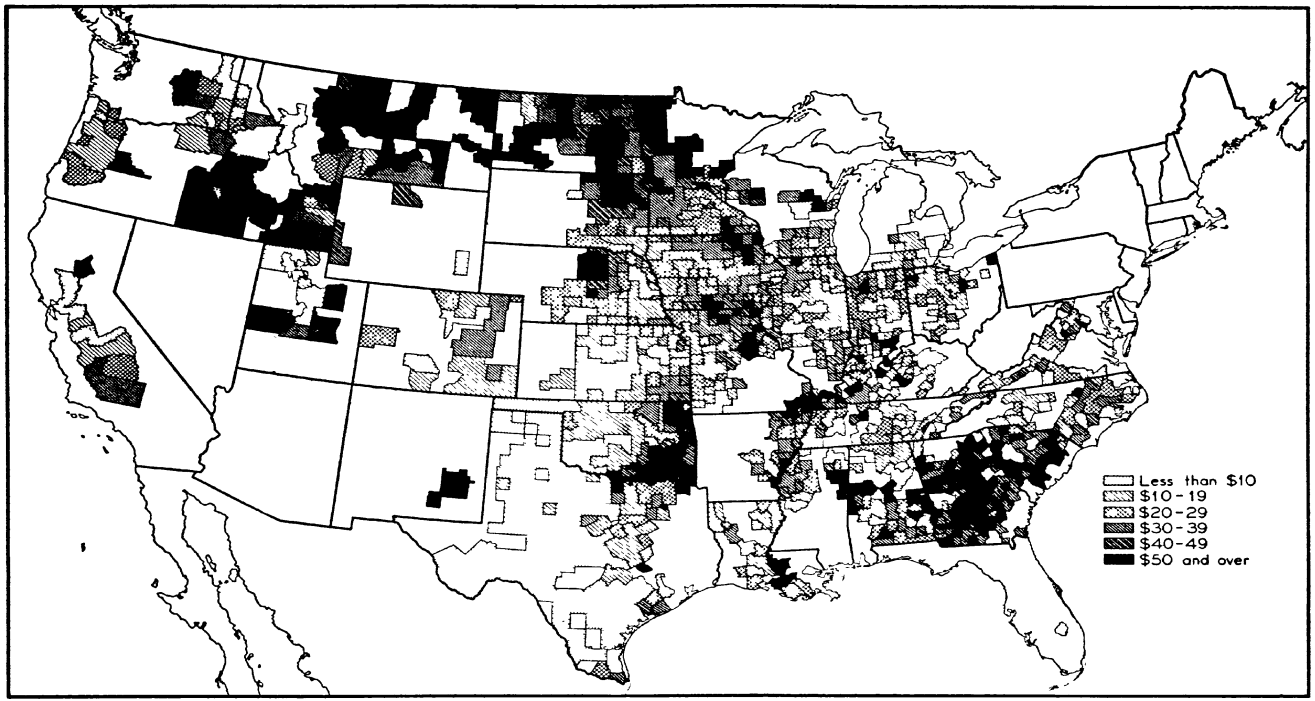
Commercial Bank Data

Before the liquidation that began in the early twenties, commercial banks were the largest holders of farm mortgage loans among the institutional lenders. At the end of 1920 their loans amounted to nearly $1.5 billion, or about 14 percent of the total farm mortgage debt.[13] But during the twenties, while the insurance companies were almost doubling their portfolios, the commercial banks lost ground as mortgage lenders. By 1931, bank holdings of farm mortgages had declined to less than $1.0 billion and by the end of 1934 to about $0.5 billion (Figure 4).

Direct evidence of area variations in foreclosures and loss rates for commercial banks is not available, but considerable indirect evidence is provided by data on deposit changes and bank failures. By their very nature, the operations of commercial banks are certain to reflect the prosperity of the communities in which they do business. Declining incomes and tightened money conditions will quickly manifest themselves by deposit withdrawals. If withdrawals continue, and if investment losses are severe, bank failures are apt to result. The relationship between bank suspensions and distress farm transfers is indicated

[13] Horton et al., *op.cit.*, Table 2, p. 12.

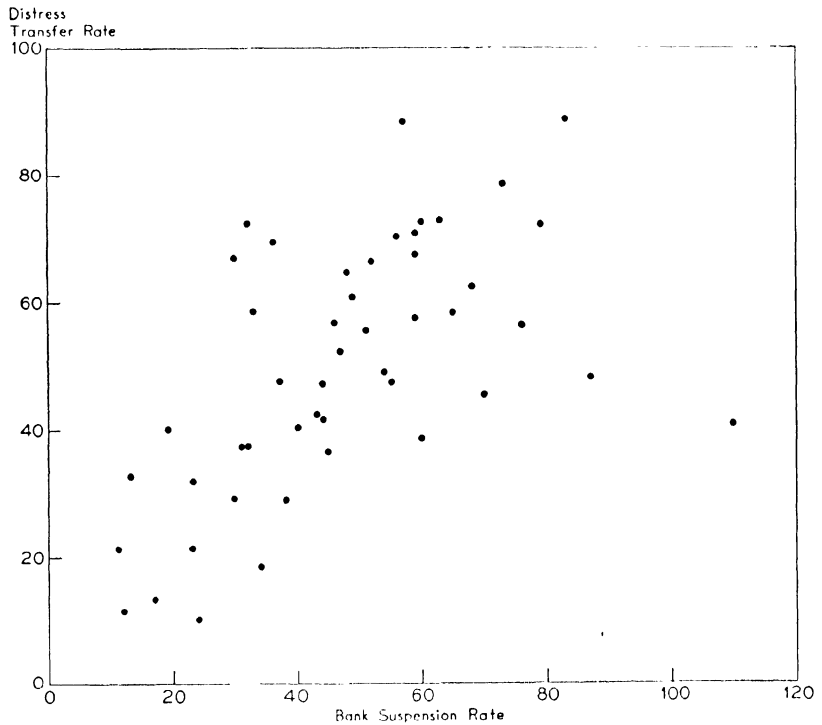
Figure 13. Distressed Assets per $100 of Farm Investment by 15 Life Insurance Companies, 1932



From unpublished data supplied by major life insurance companies. For areas shown in white, few or no loans were reported. See footnote 12 and text preceding it.
Distressed assets, given as of December 31, 1932, include investment in farm loans under foreclosure, in farms acquired by deed or foreclosure, and in previously acquired farms sold with title retained. Total farm investment includes the foregoing as well as investment in farm loans not under foreclosure.

in Figure 14. States with a high rate of bank suspensions usually had a high rate of distress transfers. Likewise there was, in the main, a significant and direct relationship between distress transfers and the shrinkage of bank deposits, as Figure 15 shows. To a small extent, of course, the two scatter diagrams reflect the same thing, for the shrinkage of bank deposits represents

Figure 14. Relation between Commercial Bank Suspensions, 1921-33, and Distress Transfers of Farms, 1925-34

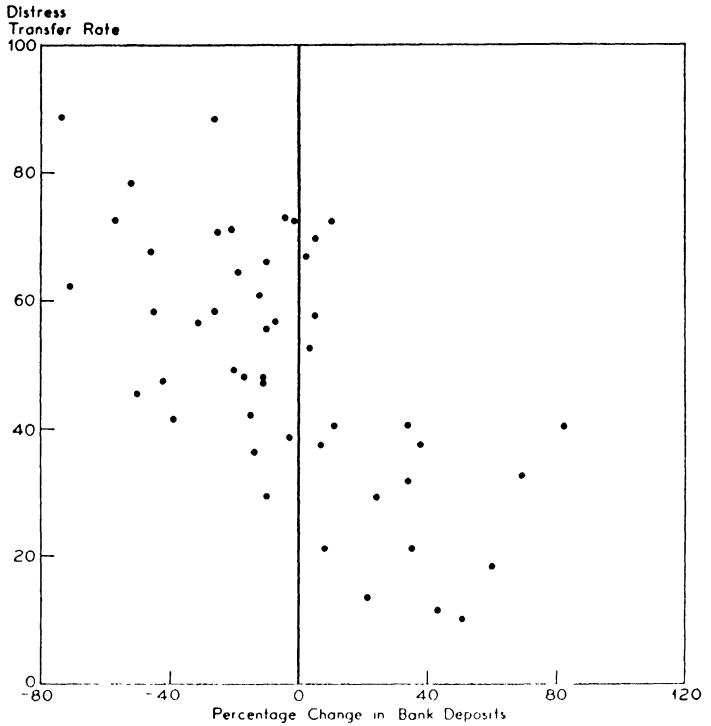


Distress transfer rate gives average annual foreclosures and assignments per thousand mortgaged farms for each state, see Figure 7. Bank suspension rate is the number of commercial bank suspensions in 1921-33, from **Banking and Monetary Statistics** (FRS, 1943, pp. 284 f.), given as a percentage of banks active in 1920 (from the annual report of the Comptroller of the Currency for 1920· Table 105, pp. 857 ff., adjusted to exclude mutual savings banks, Table 74, p. 816).

bank suspensions as well as deposit withdrawals from active banks.

On a countrywide basis, farm mortgage debt held by commercial banks during the interwar period was not large compared to their other earning assets. At the end of 1920, when the banks were the most important of the institutional lenders

Figure 15. Relation between Change in Commercial Bank Deposits, 1919-34, and Distress Transfers of Farms, 1925-34



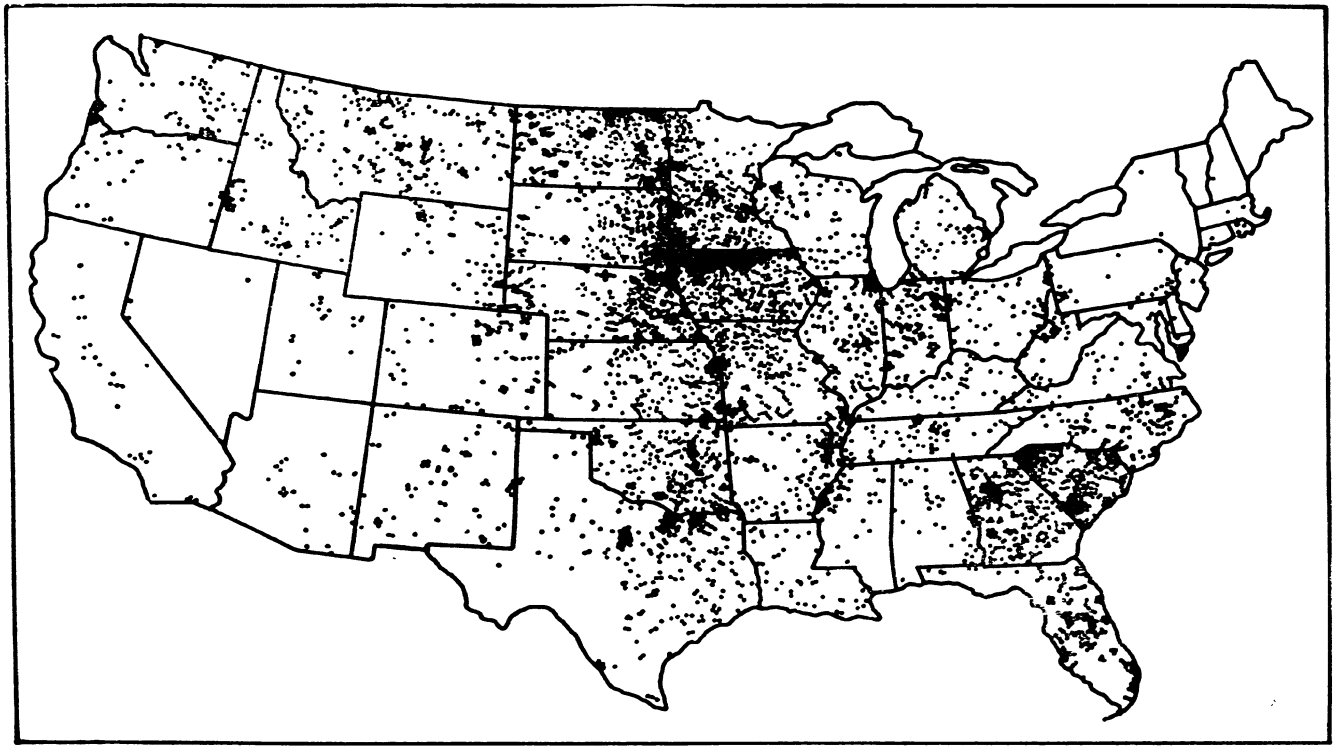
Distress transfer rate gives average annual foreclosures and assignments per thousand mortgaged farms for each state, see Figure 7. Percentage changes in commercial bank deposits were calculated from data for 1919 and 1934, June call dates, in **Banking and Monetary Statistics** (FRS, 1943, pp. 24 ff.).

concerned, farm mortgage loans amounted to only 5 percent of their total loans and discounts. In states where agriculture is the principal industry, however, farm mortgage loans constituted a more important segment of bank earning assets: for example, in North Dakota 14.2 percent, in Minnesota 16.4 percent, in Iowa 23.8 percent, and in Mississippi 26.4 percent.[14]

Bank suspensions during the twenties were mainly in agricultural areas (Figure 16). Concentration was heavy in a strip running north to south from North Dakota and Minnesota to eastern Texas. Georgia and South Carolina also had numerous bank failures. After 1929, the volume of suspensions increased

[14] V. N. Valgren and Elmer E. Engelbert, *Farm Mortgage Loans by Banks, Insurance Companies, and Other Agencies* (U.S. Department of Agriculture, Bulletin 1047, December 1921), Table 3, p. 8.

Figure 16. Bank Suspensions, 1921-29



After a map supplied by the Board of Governors of the Federal Reserve System.

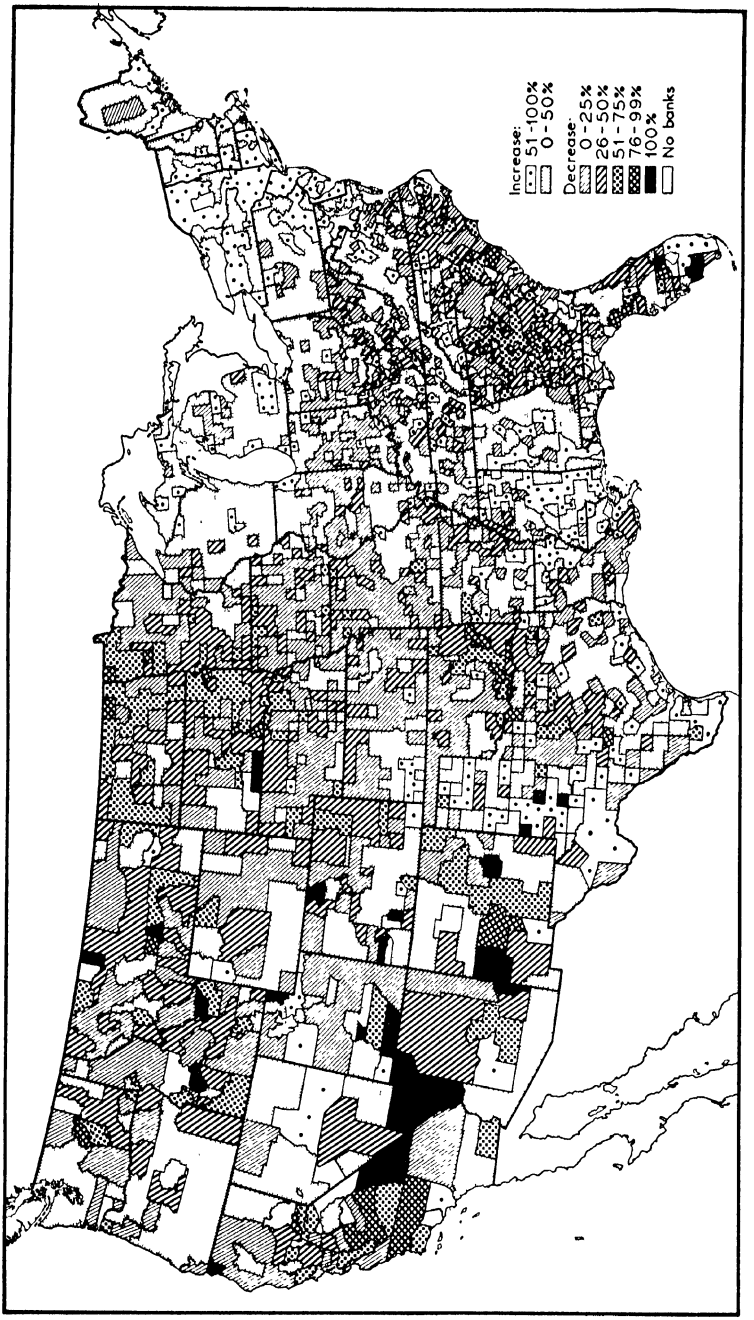


Figure 17. Percentage Change in Total Deposits of Commercial Banks, 1920-29

Based on a special tabulation supplied by the Federal Deposit Insurance Corporation.

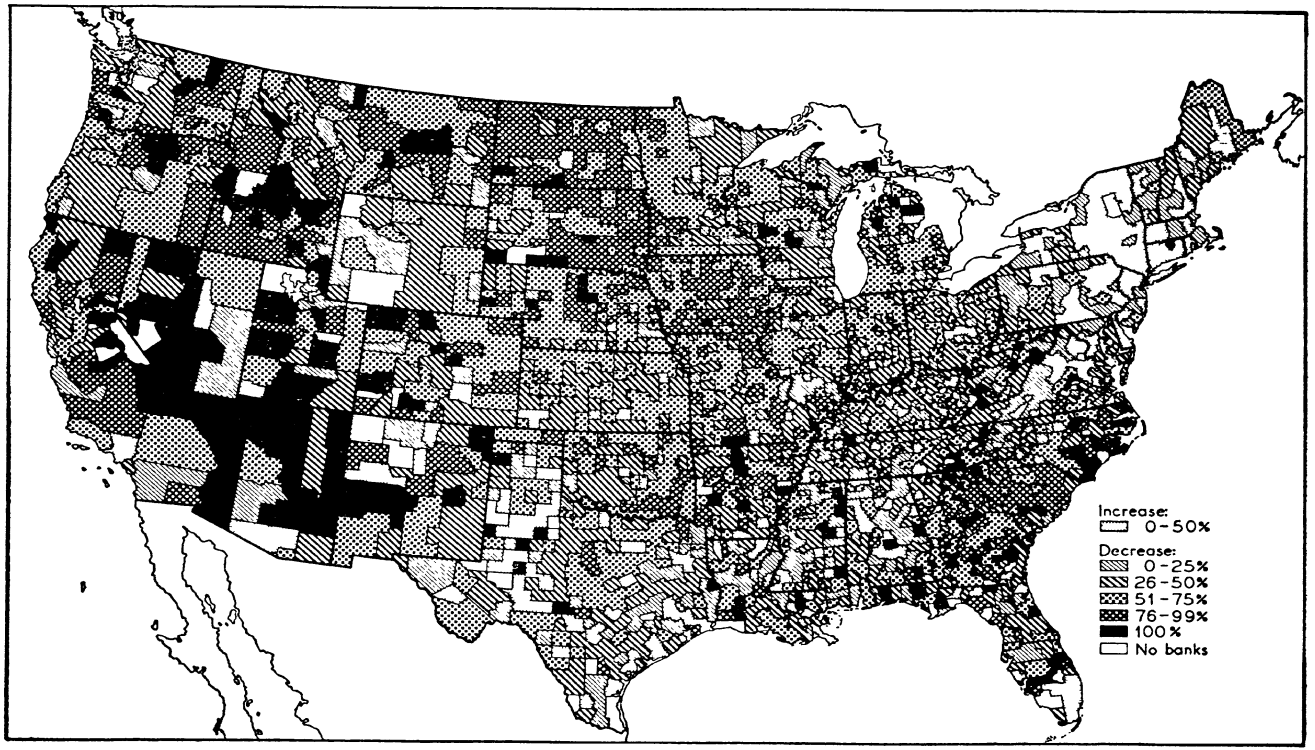
rapidly and spread to many industrial areas. By the end of 1933, when the wave of failures had about subsided, the cumulative number of bank suspensions for 1921-33 inclusive amounted to 50 percent of the state and national commercial banks active on June 30, 1920.[15] In the industrial Northeast, where bank failures were relatively few, the percentage of suspensions ranged from 11 percent in New Hampshire to 34 percent in New Jersey. In the Far West, California had a relatively low ratio of 19 percent. States with exceptionally heavy suspension rates included the following: Florida, 110 percent (evidently some of the suspended banks were organized after 1920); Michigan, 87; South Dakota, 83; Iowa, 79; Arkansas, 76; and South Carolina, 73.

The pattern of deposit changes further highlights some of agriculture's trouble spots. Deposit changes during the twenties are shown in Figure 17. During the early thirties the decline in deposits continued and spread (Figures 17 and 18). By the end of 1933 deposits in most of the northern Great Plains, Iowa, and Minnesota were less than half those of 1920. Similar shrinkages occurred in Arkansas, Georgia, eastern Oklahoma, South Carolina, and scattered counties throughout the Mountain region. Areas of relatively good economic conditions, indicated by an increase in deposits between 1920 and the end of 1933, show up in the northeastern states and western Texas. In areas such as the Far West where branch banking is important, the maps reveal mainly the experience of independent banks, since deposits of branch banks are reported for the county in which the head office is located. Possibly, experience in these areas may have been more favorable than the maps indicate. In thinly populated counties of the Mountain region the decline of deposits to zero usually meant that there was only one bank in the county, and it failed.

In analyzing the maps showing changes in deposits it is well to realize that during the farm boom of 1919 and 1920, when farmers borrowed heavily and agricultural prices were exceptionally high, there was a heavy flow of investment funds into agricultural communities. Thus the decline of deposits in some areas was a natural readjustment to more normal conditions. Nevertheless, considerable hardships and distress resulted.

[15] From the source noted on Figure 14.

Figure 18. Percentage Change in Total Deposits of Commercial Banks, 1920-33



Based on a special tabulation supplied by the Federal Deposit Insurance Corporation.

Trends in Land Values

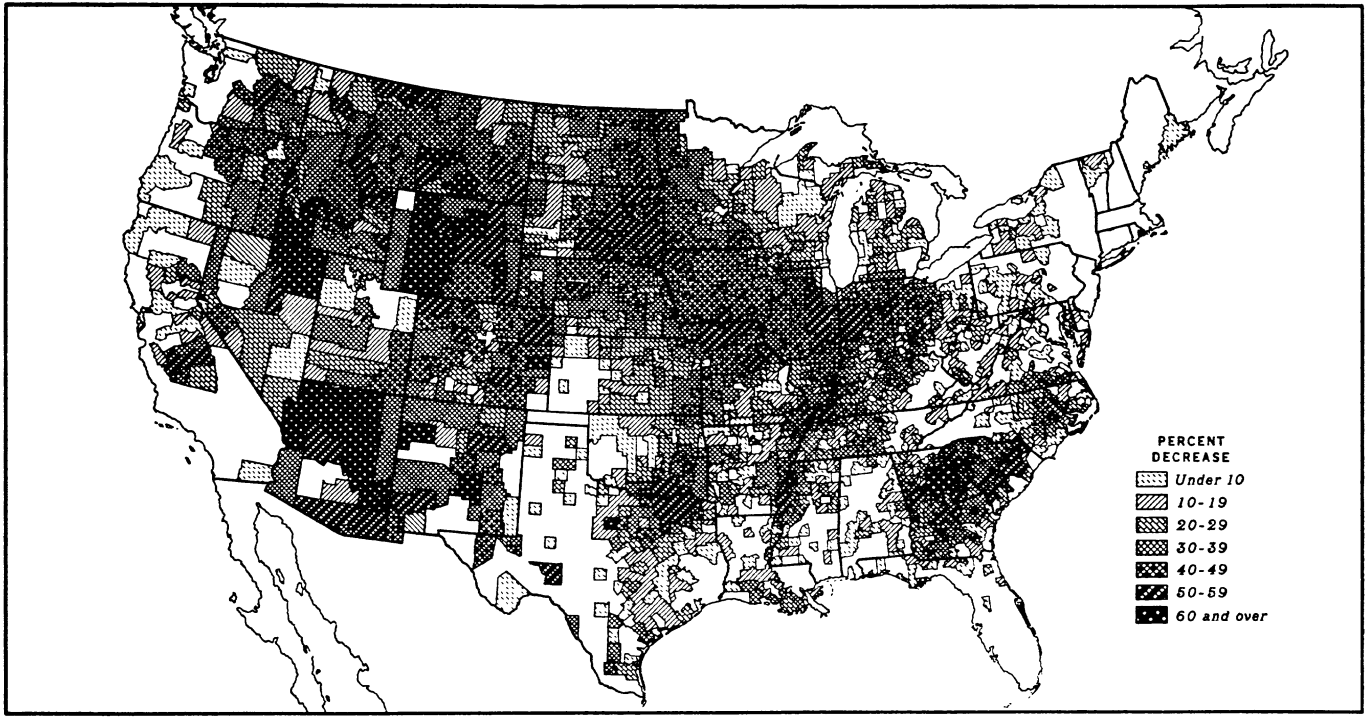
Indirect evidence of farm mortgage distress in the interwar period is afforded by the Census of Agriculture estimates of increases and decreases in land values by counties, the decreases being particularly significant (Figures 19, 20, and 21). Land values are the net result of numerous economic forces, including the mortgage situation; and in turn land values exert a reciprocal effect upon the mortgage situation. When land prices increase, mortgage debt eventually follows suit, thus setting the stage for possible future trouble. If farm incomes later decline substantially, some decrease in land values and some debt distress will develop almost automatically. The decrease in land values reduces loan security and operator equities; and any attempt by lenders to protect their investments through foreclosure or forced sale will merely aggravate the situation by driving prices down further. In short, declines in land values are both a cause and an effect of farm mortgage distress, and it is unlikely that either will develop to any great extent without the other. Exceptions may occur in areas having a small amount of mortgage debt. Even in a severe agricultural depression such areas might experience considerable declines in land values without noticeable mortgage distress. In general, however, farm mortgage distress during the interwar period was most acute in the areas in which land values declined the most (Figure 22).

From 1920 to 1930, decreases in farm real estate values were greatest in the Southeast, the Corn Belt, the eastern Great Plains, southeastern Oklahoma and northeastern Texas, and scattered areas throughout the Mountain region (Figure 19). Increases occurred in the Northeast, Florida, the western portions of Texas, Oklahoma, and Kansas, and parts of California and the western half of Washington and Oregon.

In the years between 1930 and 1935, which cover the worst phase of the depression, only a few counties in the United States escaped the deflation of farm property values (Figure 20). The extent of the decline is indicated by the fact that nine-tenths of the counties experienced decreases of 20 percent or more, and values dropped 30 percent or more in over two-thirds of all counties. Declines of 40 percent or more occurred mainly in the western Corn Belt, South Dakota, Nebraska, and eastern Oklahoma.

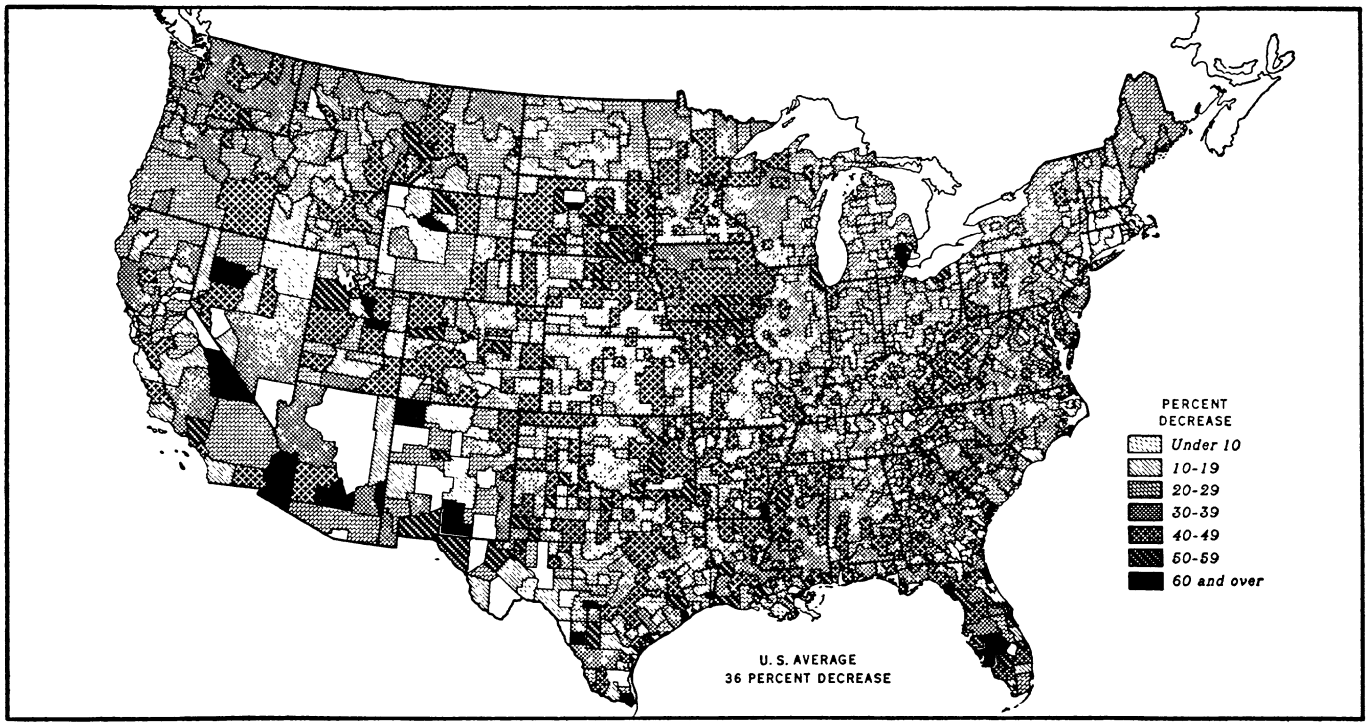
By 1935 many agricultural areas had begun to recover economically. Reflecting this improvement, land value increases

Figure 19. Decrease in Value of Farm Real Estate per Acre, 1920-30



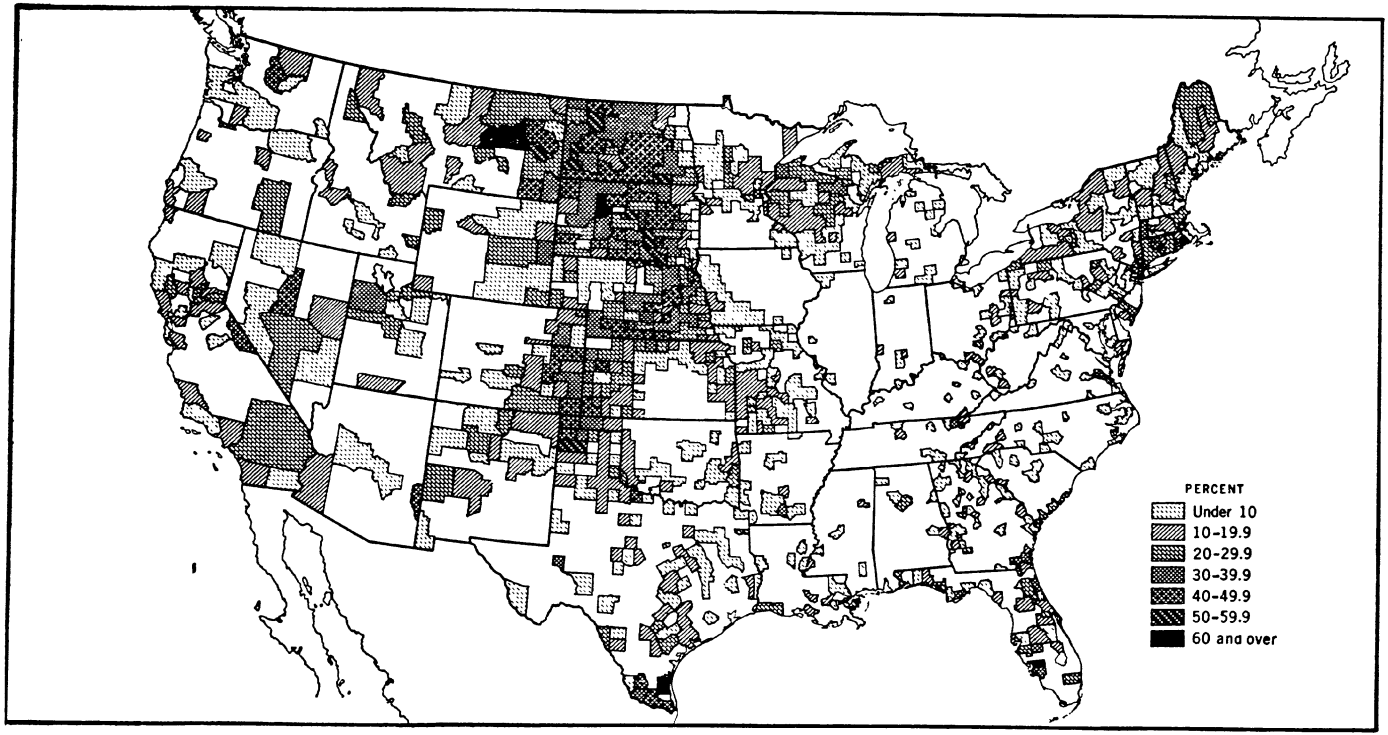
Map supplied by U.S. Department of Agriculture, Bureau of Agricultural Economics.
Based on census data for value of farm land and buildings as of January 1, 1920 and April 1, 1930. Values increased in areas shown in white.

Figure 20. Decrease in Value of Farm Real Estate per Acre, 1930-35



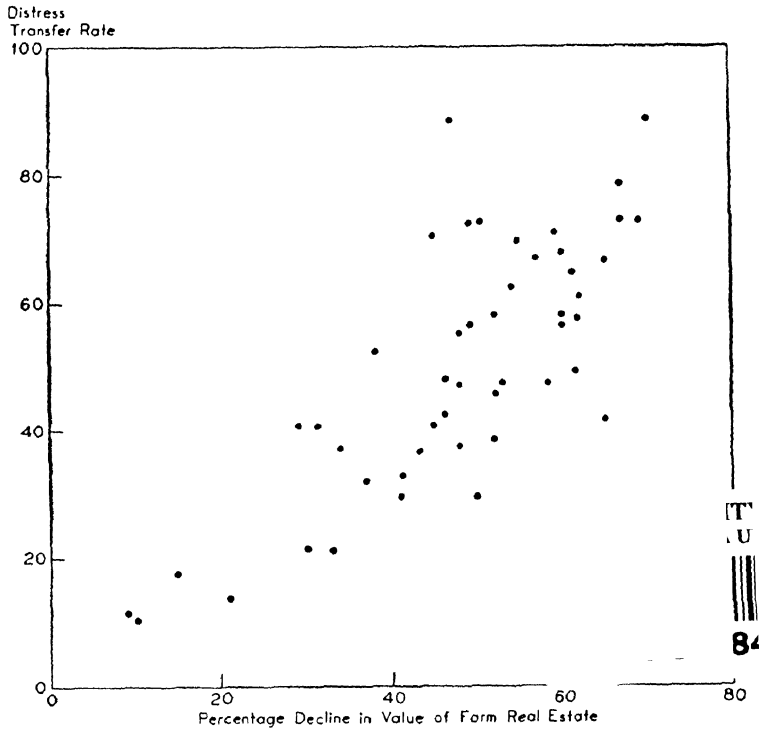
Adapted from map supplied by U.S. Department of Agriculture, Bureau of Agricultural Economics; based on census data for value of farm land and buildings as of April 1, 1930 and January 1, 1935. Values increased in areas shown in white.

Figure 21. Decrease in Value of Farm Real Estate per Acre, 1935-40



Map supplied by U.S. Department of Agriculture, Bureau of Agricultural Economics.
Based on census data for value of farm land and buildings as of January 1, 1935 and April 1, 1940. Values increased in areas shown in white.

Figure 22. Relation between Decline in Farm Real Estate Values, 1920-35, and Distress Transfers of Farms, 1925-34



Distress transfer rate gives average annual foreclosures and assignments per thousand mortgaged farms for each state; see Figure 7. Declines in value of farm land and buildings were calculated from the index of the Bureau of Agricultural Economics in **Agricultural Finance Review**, November 1952 (p. 123).

were general between 1935 and 1940 in the Corn Belt, the South, and the Mountain region, and along the west coast (Figure 21). Exceptions were the northeastern and Great Plains states. There the financial condition of farmers remained generally unfavorable through the late thirties.

Location of High and Low Distress Areas

A review of the foregoing maps showing variations in general economic conditions, in over-all foreclosure experience, and in foreclosure and loss experience reported by specific lenders indicates considerable similarity in distress patterns. There are, it appears, four, or possibly five, important farming areas where mortgage distress was very much worse than average, and there are four areas where experience was very much better than

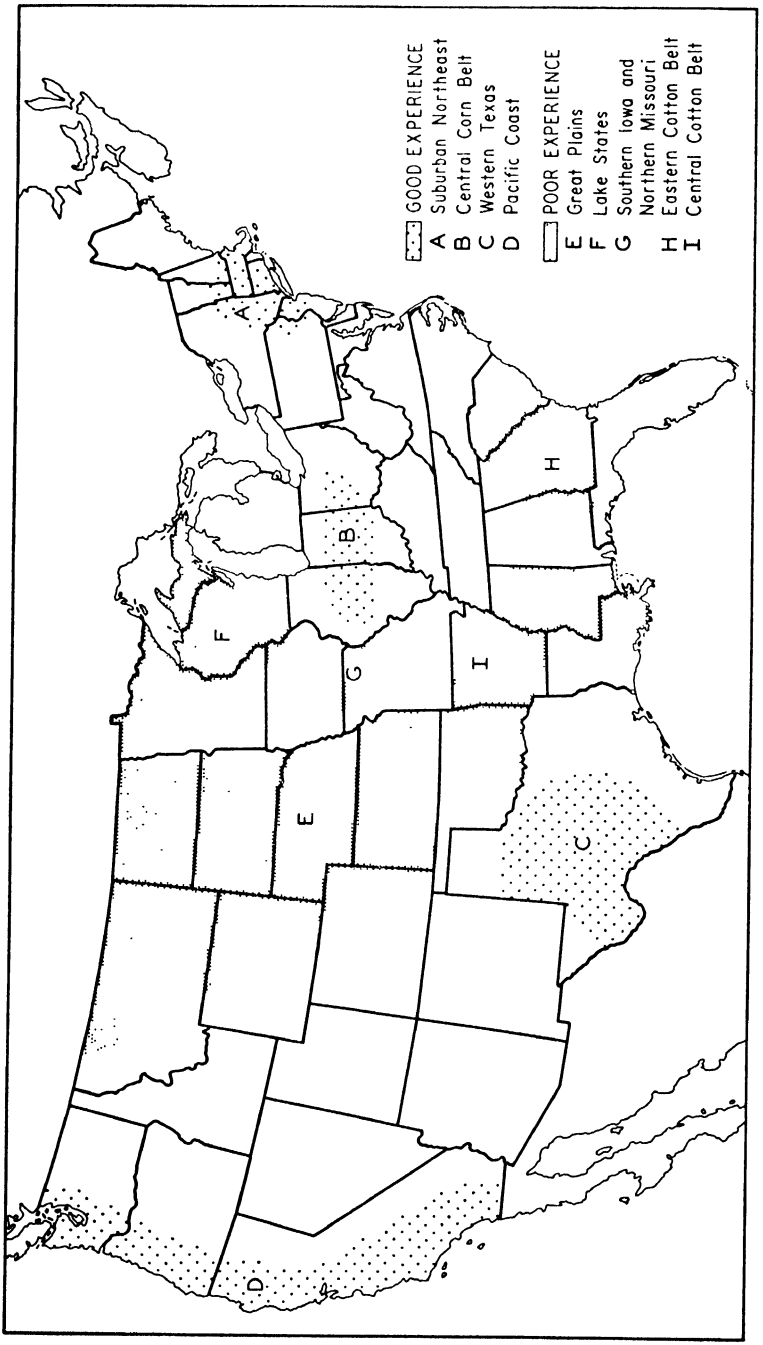


Figure 23. Major Areas of Good and Poor Farm Mortgage Loan Experience, 1920-40

average (Figure 23). Of course variations occurred within these broad areas, and in scattered counties (not indicated) mortgage experience differed considerably from that of the area as a whole. A brief description of the high and low distress areas follows, summarizing the evidence in each case.

Great Plains: The northern and central plains area containing the Dakotas, most of Montana, Nebraska, Kansas, and the eastern parts of Wyoming and Colorado is the most conspicuous of all the trouble spots because of its geographical extent. All the direct evidence heretofore considered—distress transfers, insurance company foreclosures, and foreclosures and losses on land bank and Commissioner loans—points to bad mortgage experience in the Great Plains during the period under review. In addition there is substantial indirect evidence in the form of bank suspensions, decreases in bank deposits, and decreases in land values.

Lake States: In the region bordering the western Great Lakes, the area of poor experience covers most of Minnesota and Wisconsin, and the northern part of Michigan that is contiguous with Wisconsin. Distress transfers, insurance company and land bank foreclosures, and especially land bank and Commissioner losses combine to show considerable mortgage difficulty there, as in the Great Plains. Decreases in land values, however, were not so evident; northern Minnesota even showed substantial increases from 1920 to 1930 and from 1935 to 1940.

Southern Iowa and Northern Missouri: The rather small distress area in the Corn Belt is important because its farming is relatively intensive and there is a considerable concentration of wealth. While the maps of distress transfers and of land bank and insurance company foreclosures all indicate trouble, probably the most dramatic evidence is the loss experience both of the life insurance companies (Figure 34, Chapter 3), which will be discussed later, and of the land banks. There was also a great deal of trouble, with serious losses, in northeastern Iowa.

Eastern Cotton Belt: The distress area in the eastern cotton lands occupies most of Georgia and South Carolina with a little of Alabama. Although the distress transfer maps do not clearly delineate the area, its very poor mortgage experience shows up plainly on the land bank and insurance company maps. Moreover, there were many bank failures, substantial declines in bank deposits, and noticeable declines in real estate values.

Central Cotton Belt: The comparatively distressed part of

the central Cotton Belt, including Mississippi, Arkansas, eastern Louisiana, and the eastern half of Oklahoma, is less of a trouble area than any of those previously discussed, though experience there was by no means good. The most definite evidence pointing to trouble in the central Cotton Belt was the experience with land bank loans.

Suburban Northeast: Southern New England and sections of New York and New Jersey within a hundred-mile radius of New York city make up an area of very good experience. Distress transfer rates were low, and the land bank experience was good. Insurance companies made very few loans in the Northeast.

Central Corn Belt: Central Illinois and parts of central Indiana and western Ohio had surprisingly good experience in comparison with the rest of the Corn Belt. This is shown most effectively on the loss rate maps for land banks and (as will appear later) for life insurance companies (page 86). The maps of land bank and insurance company foreclosure rates also indicate better than average experience in the central Corn Belt.

Western Texas: Here the ranching and small grain areas of the southern Great Plains are joined with the western end of the Cotton Belt. But unlike the northerly sections of the Great Plains and the easterly sections of the Cotton Belt, western Texas had excellent farm mortgage experience, which is conspicuous on all the land bank and life insurance company maps. The area is also noteworthy as one of the few sections of the country that had substantial increases in land values during the twenties. Of further interest is the small number of bank failures in western Texas.

Pacific Coast: Farm mortgage experience from southern California to northwestern Washington was generally good. This is confirmed by the distress transfer maps, insurance company foreclosure rates, and land bank foreclosure and loss rates. Increases in land values were general throughout the twenties.

2

GREAT PLAINS AND MOUNTAIN STATES

THROUGHOUT most of the Great Plains and Mountain region, farmers' financial problems began early in the interwar period and were severe and prolonged. This region of wheat farms and range land (including, as may be seen on the color map in the back of the book, most of the area in the Dakotas, Nebraska, Kansas, Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, and Nevada)[1] contains one of the worst of the trouble spots delineated in the preceding chapter—section E in Figure 23. The unfavorable financial experience in the Great Plains and Mountain states is hardly surprising, for the region as a whole has suffered at times from practically all of the serious hardships that plague farmers: droughts, ruinously low prices for most of the products of the region, and the aftermath of speculative excesses.

Physical Characteristics of the Area

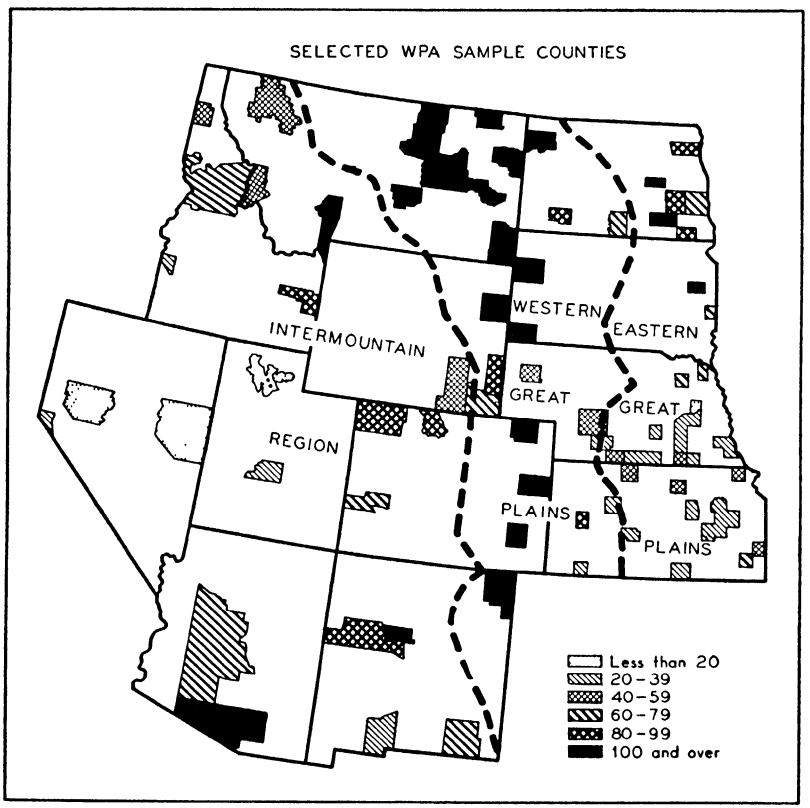
The Great Plains and Mountain states are highly heterogeneous. Throughout their vast area of over a million square miles there are tremendous variations in climate, soil, topography, susceptibility to erosion, and economic conditions. The whole region, in fact, divides naturally into three subregions based upon climatic and physiographic characteristics: eastern Great Plains, western Great Plains, and Intermountain (Figure 24). In most of the eastern Great Plains, which includes roughly the eastern halves of the Dakotas, Kansas, and Nebraska, annual rainfall averages 20 inches or more (Figure 25). The native vegetation is tall grass, and conditions are generally favorable to crop farming. In the northern and southern parts of the eastern Great Plains wheat farming prevails (see the color map). The central portion, however, including southeastern South Dakota, eastern Nebraska, and part of northeastern Kansas, is really an extension of the Corn Belt. Farming there is relatively intensive, with grains and livestock the principal products. A large

[1] Parts of Texas and Oklahoma belong in this category too, but those states can most conveniently be discussed in Chapter 4 in connection with the Cotton Belt. The Pacific Coast states, which include the western rim of the region, will be discussed in Chapter 5.

proportion of the total value of farm property for the entire area is concentrated in the eastern subregion.

In the western Great Plains annual rainfall averages less than 20 inches. For the most part agriculture is limited to cattle and sheep ranching and the production of small grains by dry farming methods. In the Intermountain subregion most of the

Figure 24. Distress Transfers, 1920-35, per Hundred Mortgaged Farms in 1930: Great Plains and Mountain States Divided Regionally



Transfer experience as in Figure 8. Regional divisions based on climatic and physiographic factors.

topography is too rough and rainfall too scanty for anything but range livestock. A few dry farming sections produce wheat, but more intensive types of farming are found only in scattered irrigated valleys.

For all their diversity, the Great Plains and Mountain states have one common characteristic—the limited amount and variability of their rainfall. In general, the amount of precipitation decreases from east to west (Figure 25), and the rate of evaporation, which influences the amount of moisture available for plant growth, increases from north to south. While almost no section of the region is free from recurrent droughts, the hazard is especially serious in the western sections. Where annual rainfall averages less than 20 inches, year to year variations in amount and distribution are important. Even slight deviations of three to four inches below normal can substantially reduce crop production. Between 1900 and the outbreak of World War II, excessively dry periods occurred in the Great Plains in 1901, 1910, 1917, 1930, 1931, 1933, 1934, and 1936.[2] Not all parts of the area were affected uniformly, but all were stricken intermittently. In the western range country there were dry periods in 1919 and 1924 as well as in most of the above years.[3] Although the eastern Great Plains has more precipitation than the other two subregions—20 inches or more annually in most of the area—even there subaverage rainfall occurring in successive years, as it did in the thirties, may prove ruinous.

Economic History before 1920

The history of agriculture in the Great Plains has shown an enormous readjustment of farming methods to the requirements of the climate. In almost any new area there is likely to be a period of financial readjustment after the initial period of expansion, which often proceeds too rapidly because of overconfidence and unfamiliarity with productive capacity. The traditional pattern is for farmers and land speculators to bid up land values, and on that basis to contract excessive debts. Then follows a reappraisal and readjustment, during which the debt structure is reduced to more reasonable proportions. All this occurred in the Great Plains, and in addition there was the necessity of readjusting agricultural technology. Fundamentally, most of the Great Plains area is adapted to ranching or extensive farming with large units and machine methods. The need for large units is particularly great in the drier regions, which are suitable only for grazing and dry land wheat farming. But the

[2] *Areas of Intense Drought Distress, 1930-36* (Works Progress Administration, Research Bulletin, January 1937), p. 4.

[3] *The Western Range* (Sen. Doc. 199, 1936), p. 139.

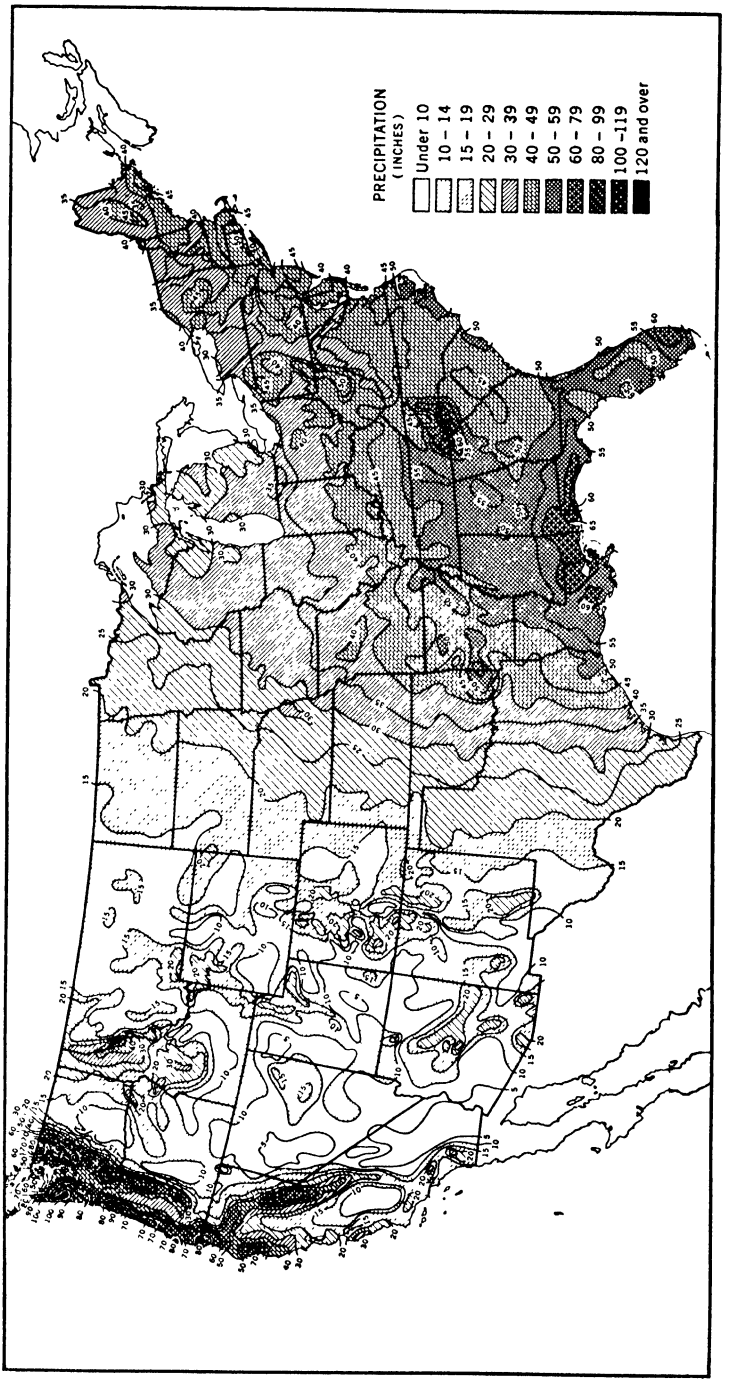


Figure 25. Average Annual Precipitation

Map supplied by U.S. Department of Agriculture, Bureau of Agricultural Economics.
Based on Weather Bureau data in **Climate and Man**, 1941 Yearbook of the Department of Agriculture.

requirement was not originally recognized, mainly because of inexperience.

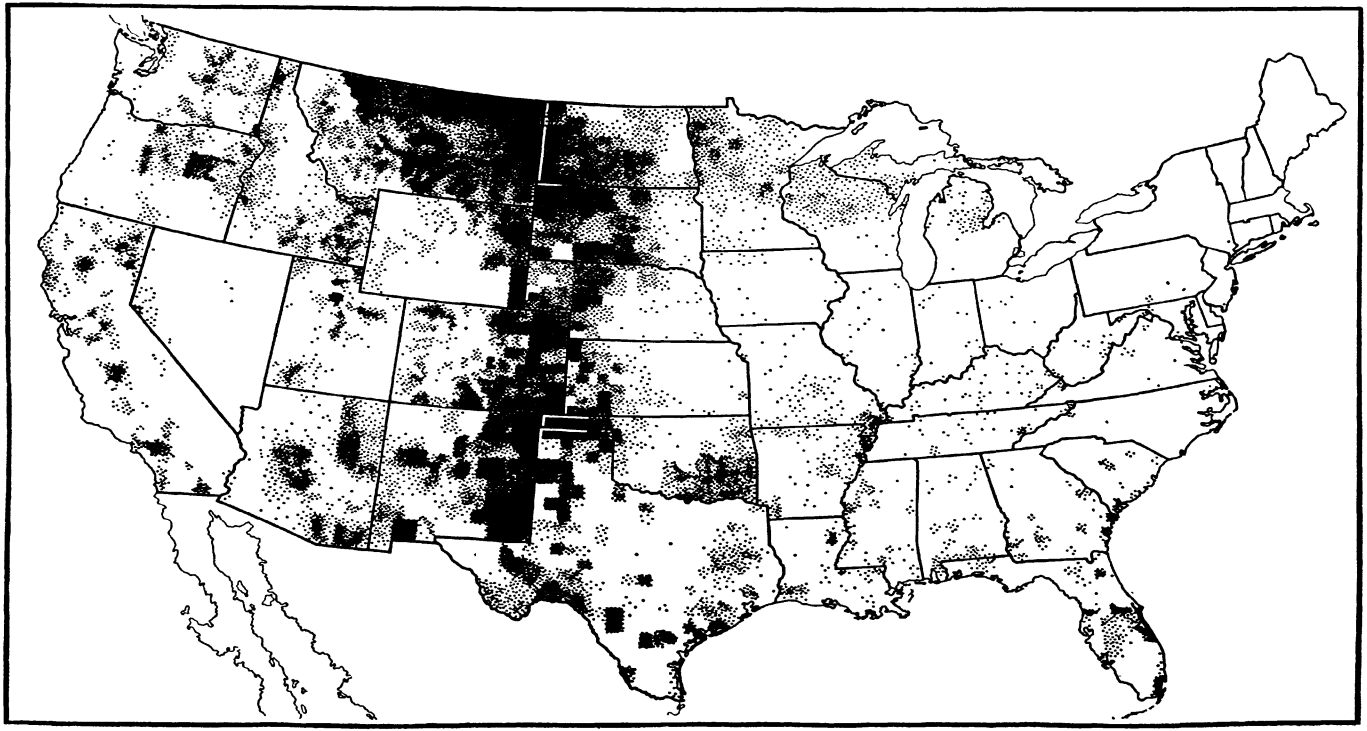
In pioneer days, when the western prairies were largely range, overstocking and lack of adequate hay reserves resulted from time to time in hardships for the livestock industry. Difficulties increased after the range began to be broken for wheat. Most of the wheat farmers were settlers who came from states to the east where rainfall was fairly uniform and relatively plentiful. They had had no experience with semiarid conditions. Only after investing their capital—much of it borrowed—did they discover the production limitations of the region. Studies of mortgage loans made by the Federal Land Bank of Spokane indicate that experience on livestock ranches was comparatively good in a number of semiarid areas where losses on wheat farms were heavy.

To the inexperience of the easterners should be added the limitations of the Homestead Act of 1862, which originally allowed only 160 acres to each settler. Such allotments were totally inadequate for the needs of extensive farming and greatly hindered the adaptation of agriculture to the region. Even the 320 acres permitted by an amendment to the Homestead Act in 1909 and the stock raising homestead of 640 acres authorized in 1916 were uneconomic in size. Later, as the inadequacy of the holdings became more apparent and as power farming developed, combination into larger units took place. Between 1910 and 1930 the average size of farm in North Dakota increased from 382 to 496 acres; in South Dakota from 335 to 439; in Nebraska from 298 to 345; and in Kansas from 244 to 283 acres. Farther west in the drier areas the increases were even greater. In Montana the change was from 517 to 940 acres; in New Mexico from 316 to 982; and in Wyoming from 778 to 1,469.[4]

Throughout the Great Plains and Mountain states overexpansion of crop acreage during World War I led to maladjustments that go far to explain the pattern of farm mortgage distress in the twenties. But overexpansion did not occur uniformly throughout the area. In the eastern Great Plains, settlement was practically complete before the war, and farmers had already learned something about the limitations of the climate, which in any case were not so severe there as farther west. In the western Great Plains, however, settlement was still in progress

[4] *Statistical Abstract of the United States: 1935*, pp. 558 f.

Figure 26. Increase in Farm Acreage, 1910-20



Map supplied by U.S. Department of Agriculture.
Based on census data as of April 15, 1910 and January 1, 1930. Each dot represents 5,000 acres.

when the war boom developed. The westward expansion of agriculture between 1910 and 1920 is indicated by the increase in the amount of land in farms (Figure 26 and Table 8). The earlier-settled states of Kansas and Nebraska showed relatively little new land in farms during that period. To the north in the Dakotas the increase was more marked. But the truly significant increases were farther west, in Colorado, Montana, and New Mexico. The expansion proceeded with optimism and a boom in land values. Lenders were quite as optimistic as the new farm settlers, and farm mortgage debt increased rapidly between 1910 and the early twenties (Table 9). The creation of farm mortgage debt, particularly in untried areas, proved basic to the extensive and acute distress soon to follow. It is significant that distress transfers of farms during the interwar period were heaviest in the western Great Plains, where the increase of land in farms was greatest between 1910 and 1920 (Figures 24 and 26).

The history of Montana illustrates a striking combination of events—the general speculative boom accompanying World War I and the expansion of crop farming in a semiarid area

TABLE 8

Land in Farms in the Great Plains and Mountain States, 1910 and 1920

(in thousands of acres)

State	*1910 (April 15)*	*1920 (January 1)*	*Change 1910-20*
North Dakota	28,427	36,215	27%
South Dakota	26,017	34,636	33
Nebraska	38,622	42,225	9
Kansas	43,385	45,425	5
Montana	13,546	35,071	159
Idaho	5,284	8,376	59
Wyoming	8,543	11,809	38
Colorado	13,532	24,462	81
New Mexico	11,270	24,410	117
Arizona	1,247	5,802	365
Utah	3,398	5,050	49
Nevada	2,715	2,357	—13
United States	878,798	955,884	9%

From *Statistical Abstract of the United States: 1935*, pages 558 f.

TABLE 9

Farm Mortgage Debt in the Great Plains and Mountain States, 1910 and 1923

(dollar figures in thousands)

State	*1910*	*1923*	*Increase 1910-23*
North Dakota	$97,830	$312,870	220%
South Dakota	84,943	451,281	431
Nebraska	148,366	691,732	366
Kansas	163,359	527,397	223
Montana	16,952	192,092	1,033
Idaho	21,423	158,737	641
Wyoming	7,363	59,514	708
Colorado	35,492	203,064	472
New Mexico	4,301	32,297	651
Arizona	4,338	48,748	1,024
Utah	6,609	52,095	688
Nevada	2,977	25,053	742
United States	$3,207,863	$10,785,621	236%

From *Farm-Mortgage Credit Facilities in the United States*, by Donald C. Horton, Harald C. Larsen, and Norman J. Wall (U.S. Department of Agriculture, Misc. Pub. No. 478, 1942), pages 219 f. Data as of January 1.

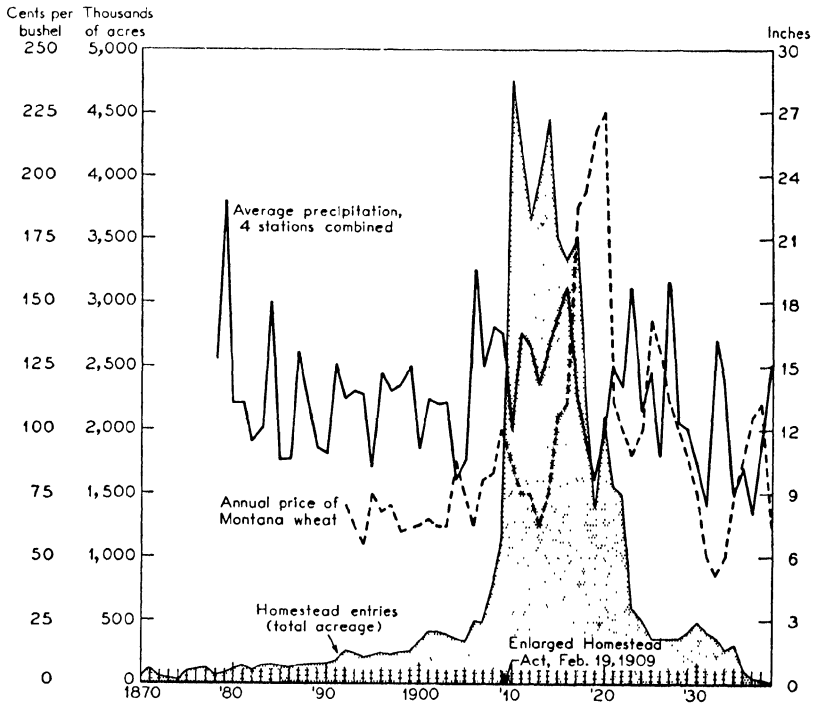
not well suited for it. As settlement progressed, the number of acres of wheat harvested had increased between 1910 and 1914 from 435,000 to 1,655,000. During the war, from 1914 to 1918, when wheat prices doubled, the acreage rose to 3,400,000. By 1920 it was 3,608,000. R. R. Renne states that the period 1910 to 1918 "was characterized by rising prices, high yields, feverish optimism, and booming business activity."[5] The heavy influx of settlers when yields were relatively favorable, prices good, and land values rising was conducive to speculation, overexpansion, and excessive borrowing.

One factor contributing to the overexpansion of crop farming in Montana was a series of unusually favorable growing seasons. Precipitation records indicate that weather conditions were especially good during the early years of settlement (Figure 27). For eleven years from 1906 through 1916, precipitation at four stations averaged about 16 inches annually; in the driest year (1910) it was 12½ inches. During the next eleven years, 1917-

[5] R. R. Renne, *Montana Farm Foreclosures* (Montana State College Agricultural Experiment Station, Bulletin 368, February 1939), p. 43.

27, it averaged only about 14 inches, and in the low year (1919) was 10 inches. The next eleven years, 1928-38, were still worse, with an average of 11½ inches, which is below the amount for the worst year of the 1906-16 period; the driest year was 1936, with only 8 inches, and 1931, 1934, and 1937 were nearly as bad, each having less than 10 inches.[6] This period of severe

Figure 27. Yearly Precipitation, Wheat Prices, and Homestead Entries in Montana, 1870's through 1938



After a chart in the work of Eckert and Maughan cited in the text. Average precipitation is for Great Falls, Miles City, Poplar, and Havre combined.

drought was the most prolonged on record. Since the relatively high and stable rainfall during 1906-16 was coupled with the fertility of the virgin soil and high prices for wheat in the early war years, it is hardly surprising that the inexperienced settlers underestimated the wide variations in the earning capacity of

[6] Phil S. Eckert and Orlo H. Maughan, *Farm Mortgage Loan Experience in Central Montana* (Montana State College Agricultural Experiment Station, Bulletin 372, June 1939), p. 4.

the new land, and it is no more surprising that mortgage lenders, too, made serious mistakes.

While wheat farming was expanding into the short grass country, livestock production was also increasing in range areas to the west. Cattle other than milk cows increased nearly three million head, or 23 percent, between 1910 and 1920 in the twelve states included in the Great Plains and Mountain region.[7] In many localities the range became overstocked and seriously damaged, which resulted in heavy feed expenses, especially in dry years. To the increase in mortgage debt was added a substantial expansion of livestock producers' cattle "paper." In the ensuing price decline, many cattlemen lost both ranch and livestock.

In the earlier-settled sections of the eastern Great Plains the war boom was somewhat less dramatic. There was little expansion of acreage, but there was a considerable boom in land values and some expansion both of mortgage and of short-term debt. The boom was very similar to that which occurred in the Corn Belt states adjoining on the east. Much of the World War I expansion was based on $2 wheat, $1.50 corn, $10 beef, and $16 hogs, and farmers did not expect the sudden drop in prices that occurred in the early twenties.

Variations in Mortgage Distress in the Twenties

Farm mortgage distress in the Great Plains and Mountain region during the twenties was general and widespread. There was, however, considerable variation among localities as to severity and timing. In general, trouble developed earliest in the two western subregions and was more severe there than elsewhere. Signs of farm mortgage difficulty appeared in western areas as early as the dry year 1917. In 1919, drought was severe, especially in Montana, where the number of distress transfers of farms in the WPA sample counties was twice that of the previous year. The main wave of foreclosures, however, started only after the price break beginning in mid-1920. By 1921 wheat prices were half those of 1919.[8] They declined further in 1922 and 1923, showing no improvement until 1924. These unfavorable prices, combined with lower yields because of drought, reduced farm incomes to very low levels. Incomes of livestock

[7] *Statistical Abstract of the United States: 1925*, pp. 610 f.

[8] *Prices Received by Farmers for Crops, Livestock, and Livestock Products, 1909-45* (U.S. Department of Agriculture, 1946), pp. 3 and 6.

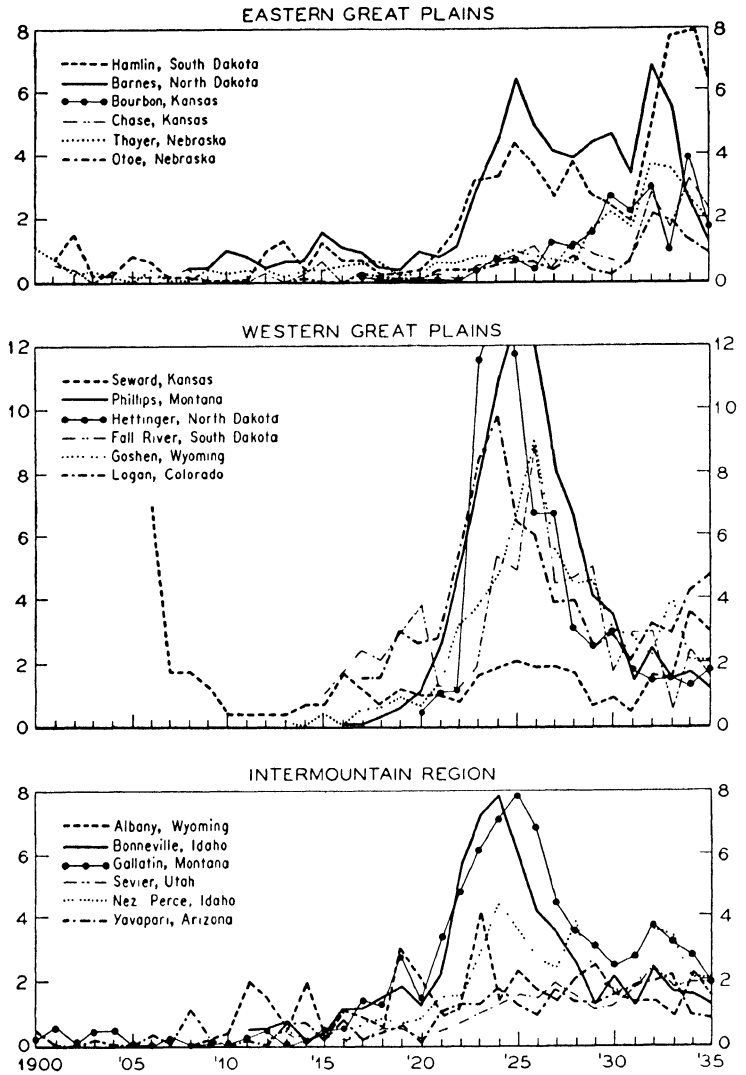
producers were similarly affected when cattle prices declined from more than $11 a hundredweight in the spring of 1919 to between $4 and $5 in the fall of 1921. Such prices, of course, did not cover current operating costs, much less debt service charges. Distress transfers of farms continued to increase during the early twenties in the western Great Plains and Intermountain subregions, reaching peak rates around 1924 or 1925, depending on locality. Thereafter they declined rapidly in most areas (Figure 28).

The price collapse of the early twenties also fell heavily, of course, on the eastern Great Plains. In Nebraska, for example, the index of farm prices (August 1909–July 1914 = 100) dropped from 197 for the year 1920 to 108 for 1921.[9] After remaining near that level through 1923, prices began to improve, and for the remainder of the decade the index for Nebraska hovered around 150. This was a substantial recovery, and it brought considerable relief. Furthermore, since the eastern Great Plains suffered less from droughts than areas to the west, crop production remained fairly good. Hence the eastern area fared much better than the western sections during the price declines of the twenties, and a large proportion of farmers were able to meet their mortgage and tax payments. Although there was considerable mortgage distress in the eastern part of the Dakotas, the highest rates of distress transfers for most localities in the eastern Great Plains did not occur until the early thirties, the peaks being reached in 1932 and 1933 (Figure 28).

Inadequacies of the banking and credit system also contributed greatly to the volume of farm foreclosures and general distress during the twenties in the Great Plains and Mountain region, as in many parts of the United States. The numerous failures of commercial banks, the major institutional lenders at that time, have already been pointed out (page 46 and Figure 16). For the most part the banks of the Great Plains and Mountain region were local institutions with limited resources, and a large part of their total investment was in farm and ranch loans. When borrowers were unable to repay their loans, many of the local banks were unable to meet their deposit liabilities, and in an effort to do so they often called loans that might otherwise have been extended. This, of course, made a bad situation worse. Eastern mortgage investment companies,

[9] *Farm Economics* (New York State College of Agriculture, Cornell University), No. 160 (April 1948), p. 4166.

Figure 28. Distress Transfers per Hundred Farms, Eastern and Western Great Plains, and Intermountain Region, 1900-1935



Distress transfers include assignments to avoid foreclosure, as well as foreclosures. Data are from **Transfers of Farm Real Estate** (BAE, 1939).

cattle loan companies, and other creditors were also poorly prepared for the drastic decline that occurred in incomes and in land and livestock values.

National recognition of the financial crisis in the Great

Plains was shown by the action of the federal government in making emergency crop loans in the northern part of the area in 1918 and again in 1921 and 1922.[10] In 1924 such loans were made in New Mexico. At the same time, the powers of the War Finance Corporation, a government agency, were enlarged to permit rediscounts of agricultural and livestock loans. Commercial banks and livestock loan companies in range areas were particularly heavy borrowers under these provisions.

Variations in Mortgage Distress in the Thirties

After showing some improvement in the late twenties, prices of wheat and livestock again dropped precipitously in the general depression of the thirties. Severe droughts occurred during the same period, and in some areas, such as the Red River valley, damage from wheat rust was severe. Farm incomes in the Great Plains and Mountain region declined to levels even lower than in the early twenties. Land values continued to decrease and farm mortgage foreclosures again rose. But the location of mortgage distress in the thirties was quite different from that of the twenties. Many areas, including most of the two western subregions, had already gone through a shaking-out process. Most of the weaker units had been eliminated by the mid-twenties, and after that wave of foreclosures both borrowers and lenders showed more caution. In general, the farm mortgage distress of the thirties was especially acute in areas that had escaped the ravages of the twenties. This was true, for example, of most of the eastern Great Plains, which might have gradually adjusted its top-heavy debt structure if the depression of the thirties had been less severe. It was also true of the Dust Bowl area of western Kansas and eastern Colorado, which had held up remarkably well during the twenties. Here the social as well as the mortgage structure collapsed in the thirties; many areas became virtually uninhabitable, and there was a mass exodus of population.

Areas of Relatively Little Distress during the Interwar Period

When the Great Plains and Mountain region are viewed as a whole, it is evident that farmers and ranchers had difficulty in

[10] Norman J. Wall, *Federal Seed-Loan Financing and Its Relation to Agricultural Rehabilitation and Land Use* (U.S. Department of Agriculture, Technical Bulletin 539, October 1936), pp. 3 and 6.

carrying their mortgage indebtedness throughout the entire period from 1920 to 1940. But despite the widespread distress of the interwar years there were scattered localities where mortgage loan experience was relatively good. In particular, north central Utah and western Montana fared well. And except in the drought years of the thirties, western and central Kansas experienced comparatively little debt distress.

North central Utah is one of the earlier-settled valleys of the Mountain region, and long before World War I its agriculture had become adjusted to the climatic and physical risks of the area as well as to available markets. In parts of this small area the annual rainfall of 20 to 30 inches is substantially above the average for the region, and there is also a long-established irrigation system. Because the water supply is adequate for crop production, a more diversified and intensive agriculture has been developed than would otherwise have been possible. This, together with the nearby markets of the Salt Lake City area, imparts a stability to agricultural incomes not general in the Mountain region. Another factor, the effect of which is difficult to measure, is the character of the Mormons who settled the area. They are noted for their hard work, sound financial management, and debt repayment ability.

The better farm mortgage experience in western Montana than in the rest of the state is also attributable in large part to a relatively favorable physical setting. With rainfall above the state average, and more extensive irrigation, a greater variety of crops can be grown than in the central and eastern parts of the state, and yields are higher.

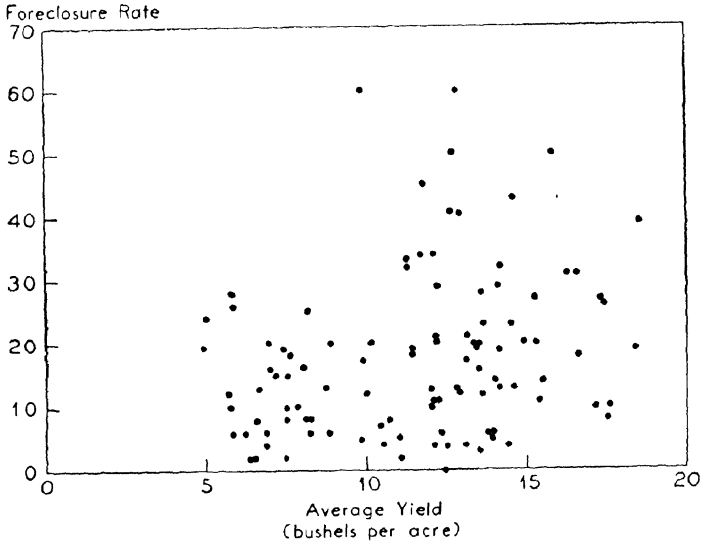
Western and central Kansas, in the central Great Plains, experienced serious financial difficulties during the Dust Bowl days of the thirties. Yet for the period 1920 to 1940 as a whole it had relatively fewer foreclosures than the northern and central plains region generally. Part of the explanation is that it is a somewhat better farming area than the Great Plains as a whole. It receives more rainfall than many other sections, and in dry years when winter wheat fails sorghums can be planted as a spring crop. Corn, livestock, and dairy herds also offer income alternatives in parts of the area. The topography is level, a fact which permits efficient use of power equipment, so important in semiarid agriculture.

But probably the most important factor influencing loan experience in western and central Kansas during the interwar peri-

od was the timing of its settlement. This occurred around the turn of the century—considerably earlier than in the Dakotas and Montana. By the advent of World War I farmers and lenders had learned something of the production limitations of the region, and early mortgage difficulties had been fairly well straightened out. Thereafter, it appears that land values were more in line with long-run income and that debts were held at moderate levels. Even though much new land was put into wheat during and just after World War I, experience gained from previous mistakes tended to discourage unduly high land values and excessive debt.

The caution that existed is well illustrated by the small number of loans made by insurance companies in the western and central portions of Kansas. Although the federal land bank made loans there, sufficient caution was exercised that foreclosure and loss rates proved generally lower than in the eastern parts of the state (Figures 9 and 10, Chapter 1). Figure 29 affords a comparison of land bank foreclosure rates and average wheat yields for all Kansas counties. It is immediately apparent that the counties with the highest foreclosure rates had approxi-

Figure 29. Relation between Crop Yields, 1924-43, and Land Bank Foreclosures, 1917-46, in Kansas, by County

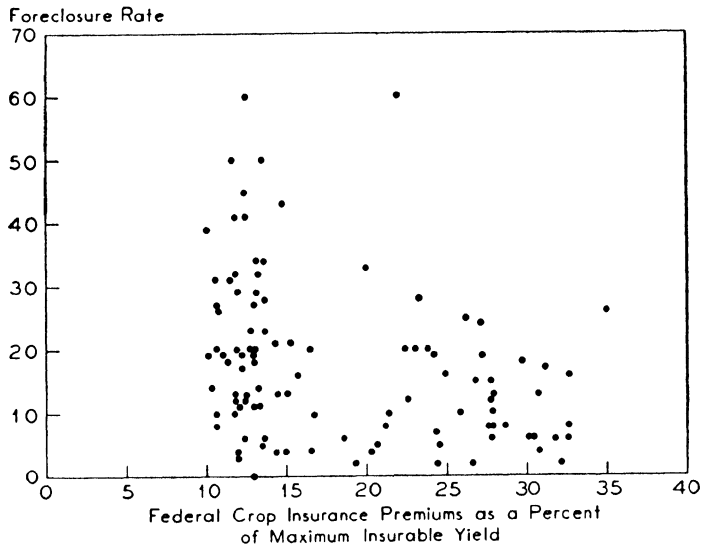


Foreclosure rate is the number of acquisitions of farm real estate through June 30, 1946 per hundred loans made in 1917-32; from unpublished data of the Federal Land Bank of Wichita. Crop yields are twenty-year averages compiled by the Federal Crop Insurance Corporation.

mately average, or even better than average, wheat yields. Such mortgage difficulty as was experienced does not appear attributable to overoptimism about productive capacity.

A measure of risk in wheat farming is obtained by expressing crop insurance premiums as a percentage of the maximum insurable yield. The relationship between this risk measure and land bank foreclosure rates is shown in Figure 30. As in the

Figure 30. Relation between Federal Crop Insurance Premiums, 1947, and Land Bank Foreclosures, 1917-46, in Kansas, by County



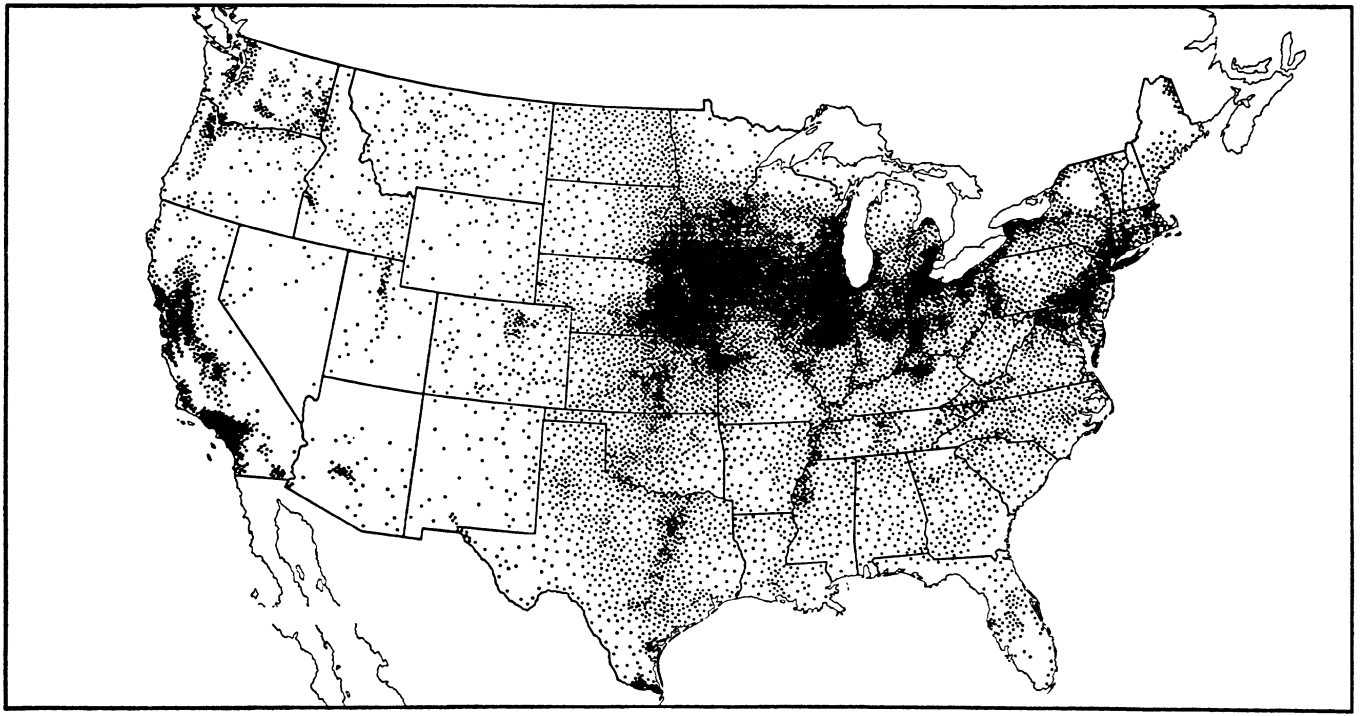
Based on data in the Federal Crop Insurance Corporation's actuarial table for the 1947 wheat crop insurance program (August 1946). Foreclosure rate as in Figure 29.

chart preceding, it is clear that the counties with conspicuously high foreclosure rates are not the counties presenting the highest farming risk. In fact the high risk counties show, on the whole, slightly better experience than the other counties.

Although the caution exercised in Kansas during and immediately after World War I was anything but typical of the Great Plains as a whole, it illustrates an important reservation in the study of mortgage experience. Physical production risks in themselves need not constitute a cause of mortgage distress. When such risks are adequately recognized, adjustments can be made—both in risk-reducing production techniques and in lending practices. The poor mortgage experience that occurred

in so many other parts of the Great Plains is an indication that adequate adjustments had not yet been achieved in those areas. Likewise, some of the mortgage trouble spots yet to be discussed seem to indicate lack of adjustment, sometimes due to inexperience with new areas, as in the northern Great Plains, sometimes due to other causes, such as rapid technological change.

Figure 31. Value of Farm Property, 1930



Map supplied by U.S. Department of Agriculture, Bureau of Agricultural Economics.
Based on census data for value of farm land, buildings, equipment, and livestock as of April 1, 1930. Each dot represents $5 million.

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THE CORN BELT

MOST of the Corn Belt is located within the five states of Ohio, Indiana, Illinois, Iowa, and Missouri, though some of it spills over into contiguous states (see the color map in the back of the book). Because of the favorable combination of soils, topography, and climate that makes the area suitable for intensive crop and livestock farming, these five states contain a remarkable concentration of the nation's agricultural wealth (Figure 31). In 1930 (the midpoint of the interwar period on which our study concentrates) they accounted for 25 percent of the value of all farm real estate, livestock, and equipment in the United States.[1]

The Corn Belt states also account for a sizable proportion of the nation's farm mortgage debt. When the debt reached its peak in 1923, farm mortgage loans in the Corn Belt states amounted to $3.3 billion, or about 30 percent of the total.[2] Although the outstanding debt in the five states has shrunk greatly since that time, it still aggregated about one-fifth of the total for the nation at the beginning of 1953.[3] Hence mortgage loan experience in the Corn Belt during the twenties and thirties was highly significant for farmers, lenders, and the economy at large.

Physical Characteristics

The Corn Belt has an excellent climate for crop production. Average annual rainfall ranges from around 26 inches in the northwest corner of Iowa to over 45 inches in some parts of the Ohio and Missouri River valleys (Figure 25, Chapter 2). The occasional dry spells are seldom serious, and are not comparable to the devastating droughts that occur from time to time in the Great Plains and Mountain region. Furthermore, adequate rainfall is usually associated with a long, hot growing season, necessary for good corn yields.

Like other parts of the country, the Corn Belt has soils that

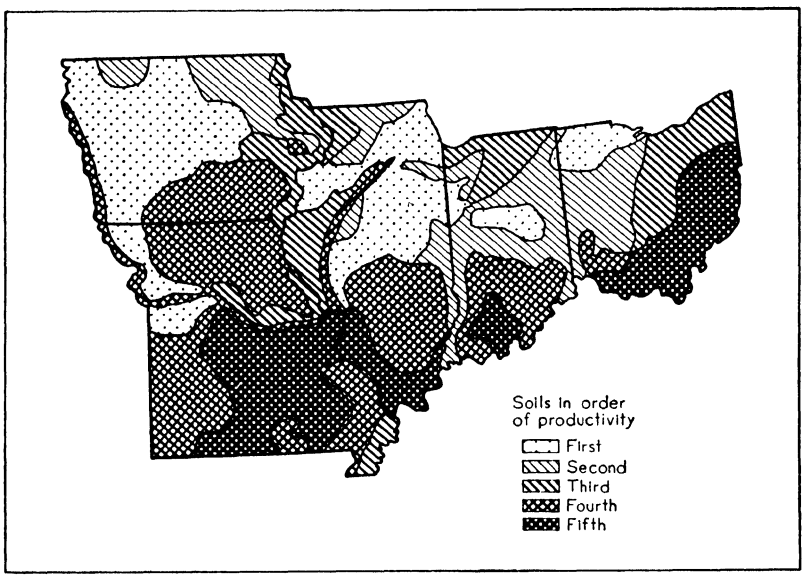
1 *Statistical Abstract of the United States: 1935*, p. 560.

2 Donald C. Horton, Harald C. Larsen, and Norman J. Wall, *Farm-Mortgage Credit Facilities in the United States* (U.S. Department of Agriculture, Misc. Pub. No. 478, 1942), p. 220.

3 *Agricultural Finance Review* (Bureau of Agricultural Economics), Vol. 15, Supplement May 1953, Table 17, p. 27.

vary widely in productivity. Topography likewise varies from the level prairie of central Illinois and Iowa to the rough and hilly country along the Ohio River. The more productive areas lie in western Ohio, central Indiana, central and northern Illinois, and northern and western Iowa (Figure 32). They are almost entirely in glaciated territory, and the soils are younger geologically and much richer in humus content than those farther south. Since the land is level, or nearly so, it is relatively free from erosion and adapted to efficient machine methods of production, but much of it requires drainage.

Figure 32. Soil Productivity in the Corn Belt



Based on general productivity of soil association groups adjusted according to long-term average corn yields, average land values per acre, and various soils data published by the state agricultural experiment stations. The areas of best soils are rated "first," of poorest, "fifth."

The southern sections of Ohio, Indiana, and Illinois, which border on the Ohio River, contain much poor land. Most of it is unglaciated, and in many localities the soils are residual sandstone and shale, with low fertility. The subsoils are often impervious and the drainage inadequate, so that in wet weather the topsoil becomes waterlogged, and in dry weather the hard layer prevents contact between the roots and the subsoil moisture. Another adverse factor is the topography, which varies

from rolling to rough and broken, thus limiting the proportion of land that can be put into crops and affecting the ease with which land can be tilled and crops harvested. Erosion is a serious hazard, and in some sections of southern Ohio it has caused so much damage that crop farming has been discontinued and occasionally farms have been abandoned. Naturally, the unfavorable conditions in the Ohio valley have had a pronounced effect on type of farming. Strictly speaking, the section does not belong to the Corn Belt, although it produces some corn. It is more an area of general farming, with many small farms of the self-sufficing or part-time type.

There is also a sizable area of comparatively poor land in southern Iowa and northern Missouri. In southern Iowa the topography is generally rough, cropland is scarce, and yields are relatively low. There, too, erosion is a serious hazard, and in many areas much of the topsoil is gone. In northeastern Missouri the topography is smoother, but the soils are rather infertile, and the subsoil is typically impervious, which affects production adversely in both wet and dry periods. The large area of the Ozarks in southern Missouri is also poor, and, in the main, suitable only for subsistence farming.

Types of Farming

Corn and livestock are the two basic farm enterprises in the Corn Belt. Although large amounts of corn are produced for sale outside the region, most of the crop is used within the Corn Belt for raising or fattening livestock. Numerous other crops are grown—for example, wheat, oats, soybeans, and hay—in most cases as part of a rotation with corn. Dairying occurs in conjunction with corn and livestock in many areas.

Within the Corn Belt, combinations of enterprise vary considerably from farm to farm. Some farms specialize, usually either in cash grains or in growing or fattening livestock. Most farms, however, engage in a combination of enterprises. To some extent the different combinations of enterprises, or types of farm, are located in specific areas. In central Iowa and central Illinois, cash corn and small grains are important sources of income. In the Missouri valley area of the region, which includes parts of Iowa and Nebraska, and again in the Mississippi valley area, which includes parts of Illinois and Iowa, livestock raising and fattening predominate.

Speculative Inflation of Land Values

The most significant characteristic of the World War I boom in the Corn Belt was its greater impact on the westerly sections than on the east. By states, the increase between 1910 and 1920 in average value of farm real estate per acre ranged from 64 percent in Ohio to 136 percent in Iowa (Table 10). The increase in dollar amount for Iowa was from $96 to $227.

The expansion of farm mortgage debt during the same decade was even more marked. The 176 percent rise for Iowa was again

TABLE 10

Average Value of Farm Real Estate per Acre for the Corn Belt States, 1910 and 1920

State	*1910 (April 15)*	*1920 (January 1)*	*Increase 1910-20*
Ohio	$69	$113	64%
Indiana	75	126	68
Illinois	108	188	74
Iowa	96	227	136
Missouri	50	88	76
United States	$40	$69	72%

Data for the states are from the 16th Census: 1940, *Agriculture*, Vol. 1, Parts 1 and 2. Figures for the United States are from *Agricultural Statistics, 1948* (U.S. Department of Agriculture), page 528.

the largest for the region (Table 11). In some sections, particularly in the west, the debt expansion was caused in part by an increase in the proportion of farms mortgaged. Of most importance, however, was the rise in the average debt per farm. Estimates compiled by the Bureau of Agricultural Economics show increases in the average size of new mortgages between 1917 and 1920 ranging between 49 and 55 percent for all the Corn Belt states except Iowa, where the increase was 69 percent. That brought the average size of new loans in Iowa in 1920 to the high level of $11,080, when the United States average was $4,270.[4]

An abundance of credit made the debt expansion possible. Much of the credit was attracted from outside sources by the general feeling of optimism over the future of Corn Belt agri-

[4] *Average Size of Farm-Mortgage Recordings of Selected Lender Groups* (Bureau of Agricultural Economics, mimeo., November 1940), pp. 3, 22 ff., and 28 f.

TABLE 11

Farm Mortgage Debt in the Corn Belt States, 1910 and 1920

(dollar figures in thousands)

State	*1910*	*1920*	*Increase 1910-20*
Ohio	$114,874	$226,458	97%
Indiana	113,276	219,141	93
Illinois	267,361	530,222	98
Iowa	430,690	1,187,185	176
Missouri	207,279	421,051	103
Total Corn Belt	$1,133,480	$2,584,057	128%
United States	$3,207,863	$8,448,772	163%

From *Farm-Mortgage Credit Facilities in the United States*, by Donald C. Horton, Harald C. Larsen, and Norman J. Wall (U.S. Department of Agriculture, Misc. Pub. No. 478, 1942), pages 219 f. Data as of January 1.

culture. Life insurance companies were heavy lenders in the region because of the opportunity of making large-sized loans on good farm land. Eastern mortgage companies were active as well. The competition of numerous lenders for farm loans was not always conducive to sound lending.

Great expansion also occurred in the local credit and banking system, particularly in the western Corn Belt. In Iowa the number of banks increased from 1,455 to 1,676 between 1914 and 1919. By June 1920 there were 1,763 active banks—more than in any other state.[5] Furthermore, there was an abundance of second mortgage money from regular lenders as well as from sellers who took a mortgage as part of the sales price. Thus credit inflation made it possible for farm operations to expand, for land values to rise to high levels, and for farmers to incur debt burdens that could be carried only with the continuation of highly favorable farm incomes. Naturally, there were many foreclosures and forced sales when the commodity markets eventually broke.

The causes of the Iowa land boom are difficult to explain—as difficult as the stock market and Florida real estate booms of the twenties. Fundamentally, of course, Iowa contains as much high grade land as any other place of similar size in the world.

[5] *Banking and Monetary Statistics* (Board of Governors of the Federal Reserve System, 1943), Table 8, p. 26; Comptroller of the Currency, *Annual Report* for 1920 (Treasury Department), Vol. 1, p. 256.

TABLE 12

World War I Inflation and Subsequent Debt Distress in the Corn Belt States

State	*Increase in farm mortgage debt, 1910 to 1920*	*Increase in land values per acre, 1910 to 1920*	*Average distress transfers, 1925-34, per 1,000 mortgaged farms in 1930*
Ohio	97%	64%	47.6
Indiana	93	68	49.1
Illinois	98	74	57.6
Missouri	103	76	66.1
Iowa	176	136	72.5

From Tables 10 and 11, and Figure 7.

A large proportion of the land can be planted to crops; soils are generally good; there are few climatic hazards; and yields are high year after year. Moreover, land values and farm incomes had been rising almost continuously since 1900. All this justified confidence in Iowa's future, but not the extreme optimism that actually developed. Much the same favorable conditions existed in other Corn Belt states, but the boom was far less extreme. A summary comparison of World War I land and credit inflation with subsequent debt distress in the Corn Belt states is shown in Table 12.

The Price Collapse

The collapse in agricultural prices and incomes that occurred in 1921 was severe in the Corn Belt, but not much more so than in the nation at large. Between 1919 and 1921, decreases in the price index of all farm products ranged from 39 percent in Ohio to 50 percent in Iowa (Table 13). These compare with 42 percent for the entire United States.

The collapse in agricultural prices after 1929 was more severe. By 1932, farm prices in Ohio and Illinois were 58 percent below the 1929 level; and in Missouri, Iowa, and Indiana the declines were 59, 60, and 61 percent, respectively. These all exceeded the decline of 54 percent for the United States as a whole. Farm cash receipts, however, do not necessarily increase or decrease by the same percentage as farm prices, since production also affects receipts. Production actually increased in the Corn Belt during the period under review; consequently, receipts de-

TABLE 13

Index Numbers of Agricultural Prices in the Corn Belt States, 1919 and 1921, 1929 and 1932

(August 1909–July 1914 = 100)

State	1919	1921	Decrease 1919-21	1929	1932	Decrease 1929-32
Ohio	218	132	39%	151	63	58%
Indiana	215	127	41	159	62	61
Illinois	220	116	47	151	63	58
Iowa	224	112	50	152	61	60
Missouri	209	118	44	147	60	59
United States	215	124	42%	149	68	54%

From *Farm Economics* (New York State College of Agriculture, Cornell University), No. 160 (April 1948), page 4137.

creased somewhat less than prices, according to estimates of the Bureau of Agricultural Economics. In fact Iowa was the only Corn Belt state where cash receipts decreased more than prices, or where receipts decreased more than in the United States generally (Tables 13 and 14).

Mortgage Experience

Compared with the Great Plains, where mortgage experience was predominantly bad, the Corn Belt stands out as a region

TABLE 14

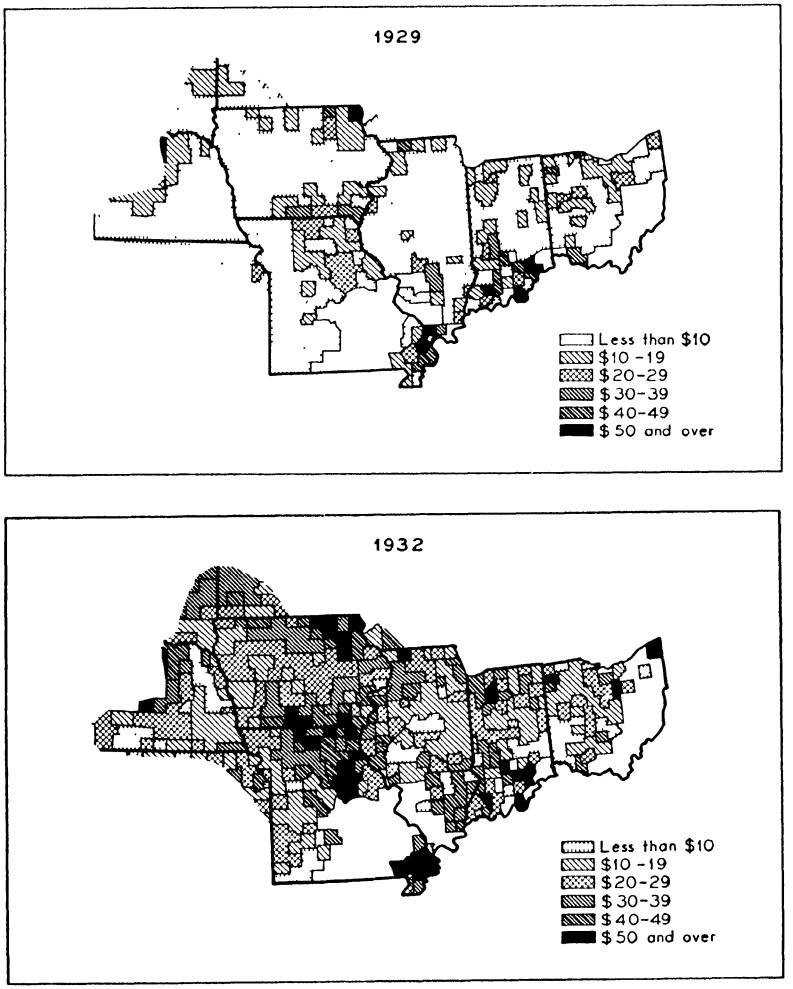
Cash Receipts from Farm Marketings in the Corn Belt States, 1929 and 1932

(dollar figures in thousands)

State	1929	1932	Decrease 1929-32
Ohio	$377,034	$180,937	52%
Indiana	327,291	145,792	55
Illinois	593,544	256,129	57
Iowa	763,085	282,799	63
Missouri	391,742	167,937	57
Total Corn Belt	$2,452,696	$1,033,594	58%
United States	$11,302,889	$4,746,815	58%

From *Cash Receipts from Farming, by States and Commodities, Calendar Years 1924-44* (Bureau of Agricultural Economics, January 1946), Table 6, pages 37 f., 40 f., 43 f., 56 f., and 60 f.

Figure 33. Distressed Assets per $100 of Farm Investment in the Corn Belt by 14 and 15 Life Insurance Companies, 1929 and 1932



Distressed assets include pending and completed foreclosures as in Figures 12 and 13, of which these are sections. In areas shown in white, few or no loans were reported.

of varied experience. Statewide figures on distress transfers indicate a pronounced increase in the severity of distress from east to west (Figures 6 and 7, pages 28 f.). From 1925 (the first year for which estimates are available) to 1939,[6] the yearly average number of foreclosures and other distress transfers per

[6] The exact period covered is from March 16, 1925 through March 15, 1940.

thousand farms was 14.9 for Ohio, 18.9 for Indiana, 20.3 for Illinois, 27.6 for Missouri, and 30.7 for Iowa. These compare with a high of 49.1 for South Dakota, and an average of 19.8 for the United States. County data on distress transfers in percent of mortgaged farms (Figure 8, Chapter 1) indicate the same east to west variation in the Corn Belt. In Ohio, Indiana, and Illinois, most of the Works Progress Administration sample counties were in the 20-39 percent class interval, and the remainder were in the 40-59 interval. In Iowa and Missouri, however, most of the counties were in the 40-59 and 60-79 percent intervals, and three counties were in the 80-99 percent interval.

Probably the best single indicator of the location of distressed areas within the several states of the Corn Belt is the experience of life insurance companies, which were very heavy lenders throughout the region. They were much more active than the land banks, for example. In 1930 the proportion of all farm mortgages held by life insurance companies ranged from 21.7 percent in Ohio to 41.9 percent in Iowa. Land bank holdings ranged from 6.8 percent in Iowa to 17.7 percent in Indiana.[7]

Distressed farm assets of a number of large life insurance companies in 1929 and 1932, given as percentages of their total farm investment, are shown in Figure 33 for counties and groups of counties in the Corn Belt. The map for 1929 shows that at that time serious difficulty had begun to develop in only a few scattered areas. The most conspicuous of them was along the Ohio River, particularly in southern Indiana. Another trouble spot, which later became much worse, was northeastern Iowa. In southern Iowa and nearby counties in northern Missouri trouble was developing too.

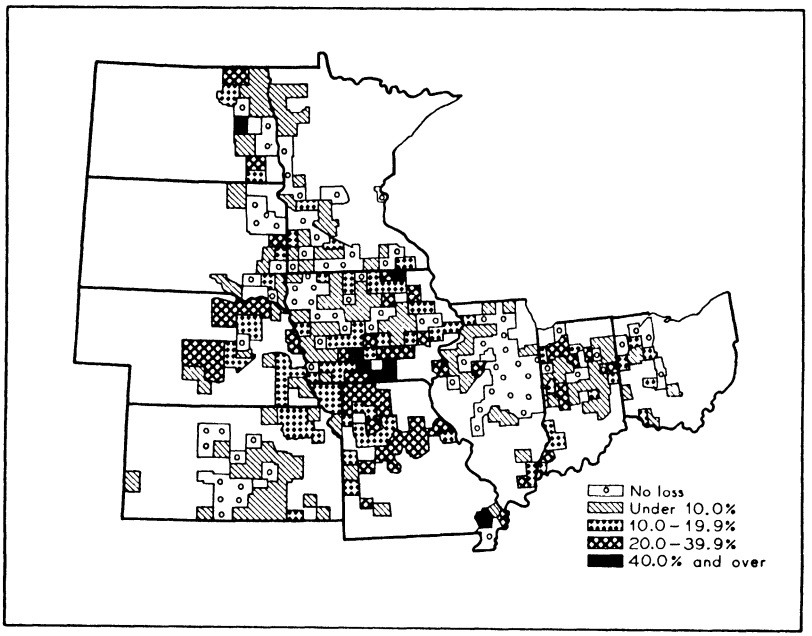
By 1932 the pattern of distress had taken definite shape. The southern Indiana area had increased somewhat and now included adjacent counties in Illinois. But the most conspicuous trouble spot was southern Iowa and northern Missouri, the area already referred to in Chapter 1, and designated G in Figure 23 (Chapter 1). Mortgage difficulties in northeastern Iowa had also expanded. In fact, high foreclosure rates had become so general that the areas of relatively satisfactory experience began to stand out. Among them was the area comprising central Illinois and parts of central Indiana and western Ohio

[7] Harald C. Larsen, *Distribution by Lender Groups of Farm-Mortgage and Real Estate Holdings, January 1, 1930-45* (Bureau of Agricultural Economics, August 1945), Tables 17, 18, and 22, pp. 60, 62, and 68.

designated B in Figure 23. Other areas of fairly good experience were southeastern Nebraska and parts of western Missouri. Experience in the highly productive areas of central and western Iowa, while not good, stands out in contrast to the heavy foreclosure rates for the remainder of the state.

For the most part insurance company losses proved heaviest

Figure 34. Loss Rates on Farms in and near the Corn Belt Sold by 13 Life Insurance Companies, 1929-37



From unpublished data supplied by major life insurance companies. Loss rate is the percentage by which receipts from sales failed to cover investment and costs. For coverage and other details see pages 40 to 43.

in the areas where foreclosure rates were high. Actual loss experience for thirteen life insurance companies in the more important counties of the Corn Belt is shown in Figure 34.[8] The

[8] Reporting companies provided the following data for acquired farms sold during 1929-37: (1) capital investment in acquired farms, including unpaid principal of loan, interest to date of acquisition, attorneys' fees, and other actual expenses to date of acquisition; (2) cost from acquisition to date of sale, including maintenance, improvements, and taxes, less income; and (3) receipts from sales of acquired farms. Loss rates were determined by computing the percent by which sales (item 3) failed to cover capital investment plus costs (items 1 and 2). Only those counties were included for which capital investment in farms sold (item 1) exceeded $100,000.

data reflect only completed sales of farms, of which there were 8,784 from 1929 to 1937 inclusive in the five major Corn Belt states. This compares with 16,366 farms remaining to be sold at the end of 1937. Naturally, the quality of the remaining farms and the trend of land values during subsequent years could have had a substantial effect on the ultimate loss rates.

Although the federal land banks had a smaller volume of loans in the Corn Belt during the twenties than did life insurance companies, in the main they experienced difficulty in the same areas. Land bank foreclosures and losses were heaviest in southern Iowa and northern Missouri (Figures 9 and 10, Chapter 1) and relatively light in Ohio, central Indiana, and northern and central Illinois.

Differences in farm mortgage distress between the eastern and western Corn Belt states appear to have resulted largely from differences in the intensity of the World War I speculative boom. On the other hand, variations within states are closely associated with local conditions affecting productivity, such as soil quality, drainage, and topography. As was pointed out earlier, the most conspicuously poor experience occurred in three areas: southern Iowa and northern Missouri, northeastern Iowa, and southern Indiana. Although it is difficult to believe that the relatively low productivity of these areas was not clearly recognized before and during the World War I boom, it seems quite likely that the degree of inferiority was inadequately appraised. As a result there was a tendency to overvalue land and overextend credit.

For example, the roughness of topography and the scarcity of good cropland in south central Iowa and north central Missouri were readily apparent; moreover the relatively low crop yields and the seriousness of the erosion hazard could not have been entirely overlooked. Nevertheless, this poor area is close to some of the best farming land in the nation. When the World War I boom began to raise land values in the better sections of Iowa, the inflation spread throughout most of the surrounding fringe areas. All over Iowa, land values and debt burdens reached heights that were not justified under normal production and price conditions, but the overextension was more extreme in the less productive areas. As a result, foreclosures and losses were heaviest in such areas during the interwar period. This is illustrated by Table 15, which includes average corn yields, voluntary farm transfer rates in 1919-20,

TABLE 15

Distress Transfer Rates 1920-35, Voluntary Transfer Rates 1919-20, and Corn Yields 1929-44, for WPA Sample Counties in Iowa

County	*Distress transfer rates 1920-35*[a]	*Voluntary transfer rates 1919-20*[b]	*Corn yields 1929-44*[c]
Appanoose	89.3	21.8	31.5
Decatur	86.4	19.5	32.0
Jefferson	82.4	16.9	39.9
Hamilton	78.5	16.7	50.9
Greene	72.1	17.5	47.8
Lucas	68.8	20.8	33.0
Woodbury	68.8	19.6	36.5
Clay	67.7	18.7	48.1
Humboldt	65.0	16.8	51.6
Monroe	64.9	17.0	33.2
Benton	59.8	12.2	52.5
Harrison	59.5	18.0	36.0
Cass	54.0	18.7	41.8
Mitchell	53.7	17.7	44.2
Audubon	51.8	14.6	45.3
Delaware	49.5	16.1	50.0
Des Moines	48.1	14.8	47.1
Cherokee	46.3	14.4	45.5
Cedar	38.7	13.3	56.4
Calhoun	36.0	16.0	50.9
Buena Vista	34.8	17.1	50.1
Winneshiek	25.6	11.0	48.0

[a] Number of foreclosures, and assignments to avoid foreclosure, during 1920-35, per hundred farms mortgaged in 1930. For sources and method of estimating mortgaged farms by county, see pages 27 and 31, with footnotes 3 and 4.

[b] Average number of voluntary transfers in 1919-20 (from *Transfers of Farm Real Estate*, Bureau of Agricultural Economics, mimeo., August 1939) per hundred farms in 1920 as given in the 1920 Census of Agriculture.

[c] In bushels per acre; based on unpublished data supplied by the Bureau of Agricultural Economics.

and foreclosure rates during the twenties and early thirties, in WPA sample counties. At the peak of the World War I boom, voluntary transfer rates were highest in counties with low corn yields. In the aftermath, foreclosure rates were highest in those

counties.[9] Feverish real estate activity apparently was accompanied by failure on the part of both farmers and lenders to distinguish sufficiently between low-yield and high-yield corn land with respect to long-term debt-carrying capacity.

It is important to note that the tendency to overvalue unproductive areas was not universal. Two very poor sections of the Corn Belt states are southeastern Ohio and the Ozark area of southern Missouri. There the productive limitations were sufficiently obvious to be fully recognized. Both sections have rough topography and poor soils; they are best suited for a self-sufficient type of farming that neither needs nor can carry much credit. Insurance companies made very few loans in either area, and the experience of the land banks indicates that they also were cautious lenders. Although WPA data for Ripley and Reynolds counties in southeastern Missouri indicate numerous distress transfers, experience there was no worse than in some of the better areas of Missouri, or even in some of the best counties of central Iowa.

[9] This naturally raises the question whether the extremely poor experience in counties like Appanoose, Decatur, and Jefferson was due primarily to low corn yields, or primarily to speculative activity. In an effort to answer the question, multiple correlation was applied to the three variables in Table 15. With the foreclosure rate as x_1, the voluntary transfer rate as x_2, and the average corn yield as x_3, the multiple regression is

$$x_1 = 23.2 + 3.426\ x_2 - 0.486\ x_3$$

The simple correlation coefficients

$$r_{12} = +0.68$$
$$r_{13} = +0.58$$
$$r_{23} = -0.69$$

are all statistically significant, and of roughly the same magnitude. The multiple correlation coefficient

$$r_{1\,23} = +0.69$$

is very little higher than r_{12}, suggesting that the combination of two variables in the regression equation is little more effective than one of the variables taken singly. The partial correlation coefficients are

$$r_{12.3} = +0.47$$
$$r_{13.2} = -0.21$$

The coefficient $r_{12\,3}$, between foreclosures and voluntary transfers, is significant by the 5 percent criterion; the coefficient $r_{13\,2}$, between foreclosures and corn yields, is not significant. This may lend some small support to the view that excessive speculation was the primary cause of distress in the poorer sections of Iowa.

4

THE COTTON BELT

THE Cotton Belt, as traditionally defined, begins just back of the Carolina-Georgia tidewater area and extends westward to the high plains of west central Texas. It includes nearly all of South Carolina, Georgia, Alabama, and Mississippi, the greater part of Arkansas and Louisiana, and most of southern Oklahoma and central Texas. It extends also, as the color map shows, into substantial areas of south central North Carolina, western Tennessee, and southeastern Missouri.

During the interwar period there was comparatively little cotton acreage outside the Cotton Belt thus defined. But since that time irrigated cotton acreage has been increasing rapidly in New Mexico, Arizona, and California. The total harvested acreage in these three states increased from 589,000 in 1939, only 2.6 percent of the total for the United States, to 2,365,000 in 1952, or 9.5 percent of the total. In volume of cotton production, California had advanced to third place by 1952, surpassing such older cotton states as South Carolina, Georgia, and Alabama.[1]

The boundaries of the Cotton Belt are determined largely by climate. The primary production requirement for cotton is a long, hot growing season, and the northern boundary is set by the factor of temperature. Very little cotton is produced in areas with growing seasons of less than 200 frost-free days and a mean summer temperature below 77° F. Within the region of suitable temperature, cotton is grown in areas where the annual average rainfall is as little as 20 inches and as much as 50 inches (Figure 25 and the color map). In all important cotton-producing areas, however, the months during which the crop matures and is harvested are relatively dry. Along the Gulf coast, where autumn rainfall in many places exceeds 10 inches, cotton is not grown because wet weather interferes with harvesting and damages the lint.

Cotton can be produced under a wide range of soil and topographic conditions. Since the 1920's, however, an increasing proportion of the total crop has been produced on the better-

[1] Data for 1939 are from *Census of Agriculture: 1945*, Vol. 2, pages 508 f.; for 1952, from *Cotton Production* (Bureau of Agricultural Economics release, December 8, 1952).

adapted lands, and substantial acreages of rough, hilly land, much of it badly eroded, have been shifted from cotton to other uses.

Crop and Livestock Enterprises in the Cotton Belt

Cotton is the principal cash crop of the South: in 1939 it accounted for about 35 percent of the value of farm output in the eight leading cotton-producing states from South Carolina and Georgia on the east to Texas and Oklahoma on the west.[2] Although acreage per farm was small in many cases, cotton was grown on 70 to 90 percent of all farms in South Carolina, Georgia, Alabama, Mississippi, Louisiana, and Arkansas; on 65 percent of all farms in Texas; and on nearly one-half the farms in Oklahoma.[3] Cotton production is characterized by high labor requirements. It is estimated that in 1939 from 20 to 40 percent of all farm labor required on farms in the eight principal Cotton Belt states was needed for this one crop (Table 16).

Although cotton is the principal crop in the South when judged by value and by labor input, it does not take up a major share of the acreage. In 1939, for example, cotton accounted for less than 30 percent of the total cropland harvested in the eastern and delta cotton states, and there was an average of 1.5 acres of corn for every acre of cotton.[4] Since 1932, acreage control programs have been the main limiting force, but in earlier years acreage was often limited by the amounts of hand labor required for thinning and picking the crop. The usual plan was to plant as much cotton as the available labor force could thin and pick. The remaining acreage would then be planted to crops that could be fitted around the cotton enterprise with available tools and labor. Corn was a common alternative, although yields in the South were typically very low compared with yields in the Corn Belt.[5] In recent years mechanical cotton pickers have de-

[2] Value of cotton lint and cottonseed produced, as a percentage of the total value of crop and livestock products sold or used in farm households. (*Census of Agriculture: 1945*, Vol. 2, pp. 511 and 589.)

[3] *Census of Agriculture: 1945*, Vol. 2, pp. 22 and 508.

[4] *Ibid.*, pp. 445 f. and 508.

[5] Corn yields per harvested acre in selected Corn Belt and Cotton Belt states averaged as follows during the ten-year period 1936-45:

Iowa	47	South Carolina	15
Illinois	46	Georgia	11
Indiana	44	Alabama	13

(From *Agricultural Statistics, 1948*, U.S. Department of Agriculture, Table 46, page 44.)

TABLE 16

Percentage Distribution of the Estimated Man-hours of Labor Required on Farms in the Cotton Belt States 1939, by Type of Enterprise

State	*Cotton*	*All other crops*	*All livestock*	*Farm maintenance*[a]	*Total*
South Carolina	34.7%	40.3%	10.9%	14.1%	100.0%
Georgia	26.2	45.1	13.7	15.0	100.0
Alabama	31.2	37.0	16.5	15.3	100.0
Mississippi	41.1	28.3	16.2	14.4	100.0
Louisiana	28.7	40.6	16.4	14.3	100.0
Arkansas	41.6	26.0	18.5	13.9	100.0
Oklahoma	19.4	31.1	34.5	15.0	100.0
Texas	30.5	27.3	27.4	14.8	100.0

From *Farm Labor Requirements in the United States, 1939 and 1944*, by Reuben W. Hecht (Bureau of Agricultural Economics, F.M. 59, April 1947), pages 44 f. and 49-54.

[a] Farm maintenance includes the farm labor required for such work as construction and repair of fences and buildings, machinery repair, work on permanent pasture and in farm forestry, construction and upkeep of ditches and structures for irrigation, drainage and erosion control, and other miscellaneous work.

creased labor requirements in some parts of the South, notably the delta areas.

For years livestock was comparatively unimportant in the old Cotton Belt. In terms of animal units the livestock population of the six states from South Carolina west to Arkansas and Louisiana was smaller in 1939-40 than that in the single state of Iowa.[6] Less than 20 percent of the 1940 farm income in those states was derived from livestock and livestock products. By 1952, however, the proportion had increased to 31 percent.[7]

[6] The number of grain- and roughage-consuming animal units fed in the above-mentioned six Cotton Belt states during the year beginning October 1, 1939 was 6,721,000; in Iowa, 7,689,000. An animal unit is defined in terms of feed consumption. A dairy cow is considered as 1.0 animal units, a sheep as 0.15 units, a hog as 0.18 units, etc. See *Animal Units of Livestock Fed Annually, 1919-20 to 1948-49* (Bureau of Agricultural Economics, F.M. 64 revised, October 1949), Tables 5 and 9, pages 15 and 22.

[7] Value of all livestock and livestock products sold, as a percentage of the value of all farm products sold. The 1940 data are from *Census of Agriculture: 1945*, Vol. 2, pages 590 and 596; the 1952 data are from *The Farm Income Situation* (Bureau of Agricultural Economics), December 1952–January 1953, Table 10, page 15.

Changes in Cotton Acreage, 1909-49

Between 1909 and 1929 the cotton acreage of the United States increased by about one-third as new cotton lands were brought into production in Texas, Oklahoma, and the far western states (Table 17). During the same period cotton acreage decreased somewhat in the eastern states, particularly in South Carolina and Georgia. The result was an important shift in the percentage distribution of acreage between the eastern and western parts of the Cotton Belt. In 1909 the cotton acreage of Texas and Oklahoma was roughly equal to that of South Carolina, Georgia, and Alabama; but by 1929 it was more than double that of the three eastern states. The shift in acreage as between the eastern and southwestern states was particularly great in the early twenties.

Underlying the drastic shifts in which Texas and Oklahoma's

TABLE 17

Cotton Acreage in the Principal Producing Areas of the United States, 1909-49

Area	*1909*	*1929*	*1939*	*1949*
		Acreage (in thousands)		
Eastern cotton states (South Carolina, Georgia, Alabama)	11,169	8,945	4,964	4,630
Delta cotton states (Mississippi, Louisiana, Arkansas)	6,510	9,401	5,595	6,280
Texas and Oklahoma	11,907	20,962	9,777	12,025
Other states[a]	2,458	3,919	2,475	3,963
United States	32,044	43,227	22,811	26,898
		Share of United States total		
Eastern cotton states	34.8%	20.7%	21.8%	17.2%
Delta cotton states	20.3	21.7	24.5	23.3
Texas and Oklahoma	37.2	48.5	42.9	44.7
Other states[a]	7.7	9.1	10.8	14.8
Total	100.0%	100.0%	100.0%	100.0%

Figures for 1909, 1929, and 1939 are from *Census of Agriculture: 1945*, Vol. 2, pages 508 f. Figures for 1949 are from *Crop Production, 1949 Annual Summary, Acreage, Yield, and Production of Principal Crops* (Bureau of Agricultural Economics), page 79.

[a] Includes Arizona, California, Florida, Illinois (1929-49), Kansas, Kentucky, Missouri, Nevada (1949), New Mexico, North Carolina, Tennessee, and Virginia.

share of total cotton acreage outgrew that of South Carolina and Georgia were a number of physical production advantages enjoyed by farmers in the western states. Topography in the western cotton areas is smoother, fields are larger, and the average cotton acreage per farm is greater. All these factors favor the use of machinery in cotton farming to an extent not feasible on the small, hilly farms with irregularly shaped fields that prevail in much of the eastern Cotton Belt. The level topography of the West is also an advantage in facilitating soil conservation, which is difficult in most of the Southeast. Thus, although scanty rainfall limits yields in many parts of Texas and Oklahoma, soils there are in general more fertile than those of the upper coastal plains and piedmont of the eastern cotton states. Finally, the dry climate of the western states is an advantage in the control of the boll weevil, since the damage caused by this pest is closely related to the amount of late summer moisture. Damage has been greatest in the humid climate of the old Cotton Belt.

Even more striking than the shift in cotton acreage within the Cotton Belt during the period 1909-29 has been the sharp reduction in total acreage since 1929. The Census of Agriculture reported 43.2 million acres in cotton in 1929, 26.8 million acres in 1934, 22.8 million in 1939, and 19.0 million in 1944.[8] The Department of Agriculture estimated that in 1945, the lowest year since well before the turn of the century, the acreage was only slightly in excess of 17.0 million acres.[9] Since then there has been a substantial increase, and the acreage in 1949 was estimated at 26.9 million acres (Table 17). Although some reduction in cotton acreage occurred in the early thirties, the greatest reduction took place after 1932 as a result of acreage control programs initiated in an effort to stem the sliding prices of basic agricultural commodities, including cotton. Legislation providing various forms of incentives to restrict cotton acreage has been in effect most of the time since then.

Control programs to date have been more successful in reducing acreage than in reducing production. Farmers have concentrated the reduced acreage on their better land, used higher-yielding varieties, increased the use of fertilizer per acre, and adopted improved cultural practices, with the result that yield per acre has increased substantially. Between 1929 and 1939,

[8] *Census of Agriculture: 1945*, Vol. 2, pp. 508 f.
[9] *Agricultural Statistics, 1948*, Table 91, p. 79.

acreage in cotton decreased 47 percent while production decreased by only 21 percent. During the next five years, 1939-44, acreage decreased 17 percent while production actually increased by 3 percent.[10]

It had long been recognized that heavy dependence upon cotton was a major weakness of the old South and that intertilling over many years had caused serious erosion and leaching and was continuing to deplete the soils of much of the region. It was also clear that more cotton was being produced than could be sold at prices that would provide a satisfactory living for producers and enable them to maintain their farms. Hence government programs provided incentives not only for reducing cotton acreage but also for shifting acreage to soil-conserving grasses and legumes, for growing cover crops, and for using lime and fertilizers.

An important phase of the agricultural programs in the South has been the encouragement of livestock enterprises. Acreages of plowable pasture land increased somewhat between 1929 and 1939. In the eastern cotton states the increase was 1.8 million acres; in the delta states, 3.1 million acres; in Texas and Oklahoma, 2.7 million acres.[11] With increases in pasture land have come increases in the number of livestock other than work animals and in the sale of livestock products. But rapid expansion of livestock enterprises has been difficult in the South, especially the Southeast. To reduce feed costs, traditionally high in the South, has required the development of new forage crops and cultural practices. Considerable progress has been made along that line. A more difficult problem is presented by the large number of holdings too small to provide a living for a farm family unless used to produce cotton or some other labor-intensive crop. Combining farms into larger units and shifting farm population into other occupations is necessarily slow. The rate of progress in this direction increases, of course, during a period of prosperity—such as World War II and after—when farm incomes are high and nonfarm job opportunities plentiful. But during periods of depression, such as the thirties, the rate of change must inevitably be slow.

Cotton Prices, 1920-40

Although the farm price of cotton declined after the first World War from 38.5 cents per pound in April 1920 to 9.5 cents per

[10] *Ibid.*

[11] 16th Census: 1940, *Agriculture*, Vol. 3, pp. 40 f.

pound a year later, there followed a rapid and fairly substantial recovery. By April 1922 the farm price of cotton was 16.1 cents per pound, and except in the 1926 marketing season it remained at that level or higher most of the time until the end of 1929. In four of the eight marketing years 1922-29 the average farm price per pound for the year was 20.0 cents or more.[12] In comparison with the prewar average of 11.0 cents (1910-14), and also with the prices of other agricultural products, the price of cotton was favorable during most of the twenties (Table 18).

Presumably because the price of cotton was holding up fairly well, no great wave of foreclosures swept the Cotton Belt states during the twenties. In fact, with the exception of South Carolina and Georgia, where boll weevil damage and severe soil erosion were involved, farm mortgage distress in the Cotton

TABLE 18

Index Numbers of Prices Received by Farmers for Cotton, All Crops, and Livestock, 1910-39

(1910-14 = 100)

Period	*Cotton*	*All crops*	*Livestock and livestock products*
1910-14	100	100	100
1915-19	175	171	157
1920-24	197	162	140
1925-29	150	143	152
1930-34	77	84	91
1935-39	87	99	115

From *The Agricultural Situation* (Bureau of Agricultural Economics), Vol. 37, No. 1 (January 1953), page 15.

Belt appears to have been little if any greater during the twenties than in the United States generally. In western Texas, debt distress was substantially less than in other parts of the United States except the Northeast (Figure 23, page 56).

In 1930, however, the price of cotton again broke sharply, and this time the collapse was much more lasting. For the years 1930-33 cotton prices averaged only 8.0 cents per pound, or 73 percent of their average in the prewar base period, and for the entire decade 1930-39 their average was only 9.4 cents, or 85

[12] *Agricultural Outlook Charts, 1948* (Bureau of Agricultural Economics, 1947), p. 49.

percent of the prewar base.[13] This drastic and prolonged decline in the price of the principal cash crop of the South resulted in a wave of foreclosures and other distress transfers of farms. In Texas and Mississippi the average annual number of distress transfers per thousand farms during 1931-33 was more than double the number during the preceding six years, 1925-30 (Table 19). Increases in the rate of distress transfers in Oklahoma, Louisiana, Arkansas, and Alabama were also large. Only

TABLE 19

Average Annual Distress Transfers per Thousand of All Farms in the Cotton Belt States, 1925-30 and 1931-33

State	*1925-30*	*1931-33*
South Carolina	25.2	29.2
Georgia	21.5	28.7
Alabama	13.4	28.3
Mississippi	16.1	41.1
Louisiana	15.8	26.4
Arkansas	17.3	31.7
Oklahoma	20.8	33.0
Texas	10.0	24.6
United States	17.1	31.7

Calculated from data on the estimated number of farms changing ownership by foreclosure of mortgages, bankruptcies, assignments, and related defaults per thousand of all farms, from *The Farm Real Estate Situation, 1929-30*, by E. H. Wiecking and B. R. Stauber (U.S. Department of Agriculture, Circular No. 150), pages 41 f., and *The Farm Real Estate Situation, 1933-34*, by B. R. Stauber and M. M. Regan (USDA Circular No. 354), pages 30 f.

The reporting years used by the Department of Agriculture end on March 15; thus the period referred to as 1925-30 runs from March 16, 1925 through March 15, 1931.

in South Carolina and Georgia, both of which had undergone heavy liquidation in the twenties, was the increase in distress transfers in the early thirties relatively moderate.

Geographic Variations in Mortgage Experience

On the basis of statewide distress transfers per thousand *mortgaged* farms (Figure 7, Chapter 1), debt difficulty was most severe in South Carolina and Georgia, which contain most of

[13] *Ibid.*

trouble area H indicated in Figure 23 (Chapter 1), and it was also severe in Mississippi, which contains a large part of trouble area I. Debt difficulty was least severe in Texas, with an annual average of 37.5 distress transfers per thousand mortgaged farms compared with 54.5 for the United States. The area in central and western Texas designated C in Figure 23, which contains much of the cotton-producing land in the state as well as most of its ranch land, is one of the relatively few large areas in the United States where mortgage experience was good during the interwar period.

EASTERN COTTON STATES

Historically the eastern Cotton Belt, which includes most of South Carolina, Georgia, and Alabama, as well as part of North Carolina, was one of the best cotton-producing sections of the country, and until 1920 it was relatively prosperous. In this section, which includes the old plantation piedmont, there were many large farms and a high proportion of the land was in crops.[14]

Although continuous row crop cultivation had resulted both in erosion and in depletion of fertility, the quality of cotton produced was high, and with heavy applications of fertilizer, yields remained fairly good. The boll weevil, which had been spreading from the west, did not reach Georgia until about 1915, and damage before 1920 was comparatively small. Thus during most of the decade spanning World War I cotton production in the eastern states was very profitable and land values increased sharply. Between 1910 and 1920 the value of farm land and buildings, as reported by the Census, increased 166 percent in South Carolina and 152 percent in Georgia, while in the United States as a whole the increase was 75 percent (Table 20). Farm mortgage debt also increased rapidly in the eastern Cotton Belt: for South Carolina and Georgia the increases between 1910 and 1923 were 377 and 474 percent, respectively.

But wartime prosperity in the eastern Cotton Belt suddenly

[14] For a description of agriculture in the eastern Cotton Belt and some of its farm problems see *Types of Farming and Farm Business Studies in South Carolina*, by J. L. Fulmer (Clemson Agricultural College Agricultural Experiment Station, Bulletin 310, June 1937); *Georgia Land Use Problems*, by W. A. Hartman and H. H. Wooten (University of Georgia Agricultural Experiment Station, Bulletin 191, May 1935); and *Factors Influencing Alabama Agriculture, Its Characteristics and Farming Areas*, by Ben F. Alvord, M. A. Crosby, and E. G. Schiffman (Alabama Polytechnic Institute Agricultural Experiment Station, Bulletin 250, April 1941).

came to a close in the early twenties, and the area soon became one of the nation's most conspicuous trouble spots—particularly in the specialized cotton-producing areas of the upper coastal plains and piedmont. By the late twenties the rates of distress farm transfers in South Carolina and Georgia were considerably higher than the rate in any other major cotton-producing state except Oklahoma, and were well above the average for the United States. In 1929 the foreclosure rates on farm mortgage loans of life insurance companies were higher in Georgia and South Carolina than in any other part of the United States except the Great Plains (Figure 12, Chapter 1). Bank deposits shrank in this area during the twenties more than in most parts of the nation (Figure 17), and bank failures were numerous (Figure 16). Between 1920 and 1930 the average value of farm real estate declined in both South Carolina and Georgia by more than 40 percent—a substantially greater decrease than in any other Cotton Belt state and greater than the average for the United States (Table 20). When the second agricultural price collapse occurred in the early thirties, the two states experienced a further increase in debt difficulties, although the rate of increase in distress transfers between 1930 and 1933 was less there than in other Cotton Belt states or for the nation—presumably because large numbers of farm businesses had been liquidated during the twenties. For the interwar period as a whole, however, land bank foreclosure and loss rates, Commissioner loss rates, and insurance company foreclosure rates were high in South Carolina and Georgia (Figures 9-13, Chapter 1).

The severity of the agricultural depression that engulfed the eastern Cotton Belt in the early twenties was apparently due to the occurrence of severe boll weevil damage at almost exactly the same time as the postwar price collapse. In other Cotton Belt states the boll weevil had arrived earlier, which gave farmers an opportunity to work out partial control methods during the period of high wartime prices. Furthermore, by reducing yields and increasing costs the weevil had exercised a restraining influence on rising land values and mortgage debts. That was true as far east as Alabama, where the wartime land boom was much less pronounced than in Georgia and South Carolina (Table 20).

The arrival of the boll weevil in Georgia and South Carolina could not have come as a complete surprise, for the pest had been traveling eastward steadily ever since it first crossed the

TABLE 20

Percentage Changes in Farm Land Value 1910-20 and 1920-30, in Size of Farm Mortgages 1917-20, and in Farm Mortgage Debt 1910-23 and 1923-40, in the Cotton Belt States

State	*Change in average value of farm real estate per acre*[a]		*Change in average size of farm mortgages recorded*[b]	*Change in farm mortgage debt*[b]	
	1910-20	1920-30	1917-20	1910-23	1923-40
South Carolina	+166%	−44%	+62%	+377%	−56%
Georgia	+152	−42	+54	+474	−43
Alabama	+100	+3	+62	+215	+3
Mississippi	+141	−24	+37	+377	−40
Louisiana	+108	−6	+52	+207	−7
Arkansas	+143	−21	+54	+574	−44
Oklahoma	+67	−14	+21	+344	−43
Texas	+98	−11	+71	+247	−5
United States	+75%	−30%	+62%	+236%	−36%

[a] From 16th Census: 1940, *Agriculture*, Vol. 1, Part 3, pages 423 and 491; Part 4, pages 279 and 375; Part 5, pages 5, 115, 213, and 321. Figures for the United States are from *Historical Statistics of the United States, 1789-1945* (Bureau of the Census), page 95.

[b] From *Farm-Mortgage Credit Facilities in the United States*, by Donald C. Horton, Harald C. Larsen, and Norman J. Wall (U.S. Department of Agriculture, Misc. Pub. No. 478, 1942), pages 162 and 219 ff.

Mexican border in the 1890's. But the amount of damage it could do appears to have been seriously underestimated. Perhaps this was partly because its greater destructiveness in humid climates was not yet well known. At any rate, when weevil damage became severe in Georgia and South Carolina in the early twenties, farmers found themselves faced simultaneously with diminished prices and greatly diminished yields. It is estimated that for the state of Georgia the reduction in cotton yield in 1921 from weevil damage was 45 percent.[15] In 1922 and 1923 the estimated reductions below full yield were 44 and 37 percent, respectively. In South Carolina the greatest weevil damage occurred in 1922, when the yield was reduced by an esti-

[15] *Cotton—Acreage, Yield, and Production, 1866-1938* (U.S. Department of Agriculture, Agricultural Marketing Service, September 1940), p. 59.

mated 40 percent. In some sections, of course, the damage was even more serious than statewide figures indicate.

Control of the boll weevil proved to be extremely difficult and costly in the humid climate of the eastern Cotton Belt, and farmers there found themselves at a distinct disadvantage in competing with cotton producers farther west. Even when the unprofitability of cotton farming in much of Georgia and South Carolina became apparent, shifts to other crop and livestock enterprises came slowly. Farmers had little experience with other types of farming, unskilled labor constituted a hindrance to sudden change, capital was difficult to obtain, and soils in many localities were not well suited to other cash crops, such as peanuts and tobacco. Moreover, some farms were too small to constitute economic units under types of agriculture less labor-intensive than cotton farming.

Debt distress in South Carolina and Georgia during the interwar period was less severe in areas with alternative cash crops than in specialized cotton-producing areas such as the upper coastal plains and piedmont. In northeastern South Carolina the soil and climate are well suited to the growing of tobacco, and in the lower coastal plains of southeastern Georgia both peanuts and tobacco are important sources of farm income. Loan experience was better in both of those areas than in the upper coastal plains and piedmont. The same is true of the coastal flatwoods area, where small-scale farms producing forest products and truck crops in combination with cotton predominate. Loans made in that area by insurance companies and the land bank were relatively few, however, and carefully selected.

Loan experience was fairly good in the limestone valleys of north central Alabama and northwestern Georgia. There the soil is productive and the topography reasonably level. Cotton and general farming predominate. The use of tractors and other labor saving machinery has been more common there than in many other parts of the eastern Cotton Belt, and control of the boll weevil has been comparatively successful because of climatic factors. Relatively good loan experience in the parts of northern Georgia and northeastern Alabama where the topography is rough and the soils are poor and stony is explained by the fact that both land banks and insurance companies were cautious in extending credit in those areas.

Although there was considerable farm mortgage distress in

southeastern Alabama in the interwar period (Figures 8, 9, 12, and 13, Chapter 1), it did not develop as early nor was it as widespread as in South Carolina and Georgia. The part of the Black Prairie extending into west central Alabama shared the relatively poor loan experience that characterized the entire black belt during the twenties, for reasons to be noted in the next section.

DELTA COTTON STATES

In the delta states—Arkansas, Mississippi, and Louisiana—the most valuable farm land is in the flood plains of the Mississippi River and its tributaries (area VII-A4 on the color map). Soils there generally are fertile, the topography is flat, and farms are of relatively large size. It was in the delta counties, therefore, that insurance companies largely concentrated their farm investments. Few loans were made elsewhere in the delta states by insurance companies except in the Black Prairie belt in the northeastern part of Mississippi (area VII-D1 on the color map). There, too, soils are rich, topography is level, and a high percentage of all land is in farms. The land banks made loans throughout the three states, but like the insurance companies concentrated their heaviest lending in the delta counties.

Both land bank and insurance company foreclosures were numerous in the delta counties in the twenties and early thirties (Figures 9, 12, and 13, Chapter 1), the sole exception being the upper Louisiana delta. Although losses by insurance companies through 1937 were small (Figure 35), land bank losses were, on the whole, relatively heavy (Figure 10).[16]

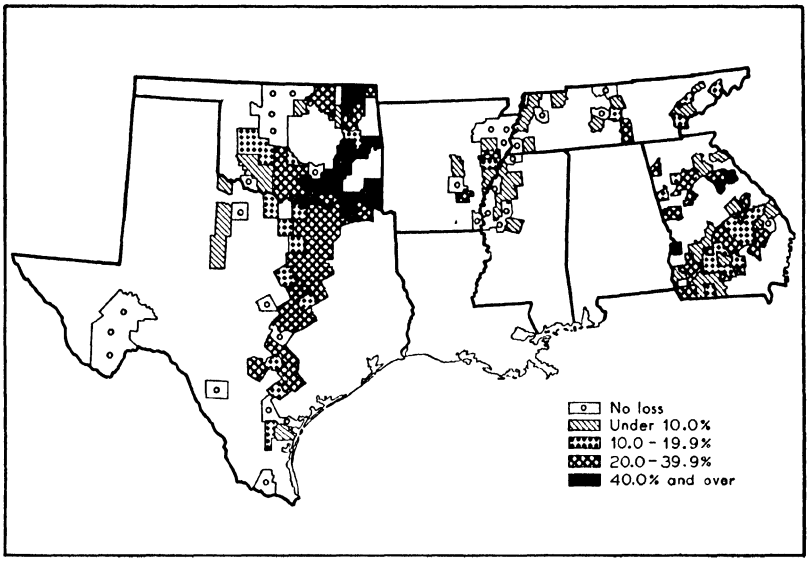
One of the important causes of debt distress in the delta has been dependence on one crop—cotton. When cotton prices are good, cotton farming is very profitable and usually results in rapidly rising land values and increasing mortgage debt. When cotton prices decline, economic distress is severe because there are few alternative sources of income from which to pay operating expenses and debt charges.

Farm mortgage foreclosures in the delta (and in the flat alluvial lands of northern Mississippi outside the delta as well) appear to have been associated also with the development of

[16] When land values were greatly depressed during the early thirties, the insurance companies held and operated more of their foreclosed farms than did the land banks, selling them at a later time, after land values had recovered somewhat.

drainage and levee improvements. From 1910 through the middle twenties numerous drainage districts were organized, and there was considerable optimism over prospective benefits from such undertakings.[17] Land values usually rose when a district

Figure 35. Loss Rates on Farms in and near the Cotton Belt Sold by 13 Life Insurance Companies, 1929-37



From unpublished data supplied by major life insurance companies. Loss rate is the percentage by which receipts from sales failed to cover investment and costs. For coverage and other details see pages 40 to 43, and page 86 n.

was projected—often to levels that long-term earnings could not support. Between 1910 and 1920, land values in parts of the delta in Arkansas increased as much as 250 percent and in Mississippi as much as 400 percent. During the twenties land values declined, in some counties falling 60 percent and more below 1920 levels (Figures 3 and 19, Chapter 1).

Land drainage was promoted, often at very high cost, by lumber companies, plantation interests, railroad corporations, and professional promoters. Bonds usually were issued and benefits assessed against the land. The tax problem became serious especially after cotton prices fell. In addition to drainage taxes

[17] See *Drainage Reclamations in the Bartholomew-Boeuf-Tensas Basin of Arkansas and Louisiana*, by Robert W. Harrison and Walter M. Kollmorgen (University of Arkansas Agricultural Experiment Station, Bulletin 476, April 1948).

and regular county and state taxes, there were taxes for levee districts, road districts, and sometimes fence districts. Harrison and Kollmorgen state that during the depression the defaulting of special improvement taxes was almost universal in Arkansas. Since that time, as a result of scale-downs and refinancing of bonded indebtedness, many districts have been placed in improved financial condition.

It has been noted that the experience with land bank and insurance company loans was much better in the delta counties of upper Louisiana than in the delta areas of Arkansas and Mississippi. The upper Louisiana delta is subject to flooding by the backwater of the Mississippi, and much of the low land is not farmed. Furthermore, because Louisiana law limits drainage taxes to fifty cents per acre for a forty-year period, the promotion of drainage activities was given little encouragement. These factors tended to restrain land values during the World War I period, made lenders cautious, and prevented the establishment of a tax burden as heavy as that in Mississippi and Arkansas.[18]

In the lower Louisiana delta, foreclosures both by insurance companies and by the land bank were comparatively heavy. Sugar cane production is important there, and it appears probable that farm mortgage distress in the mid-twenties was associated with the cane diseases that developed during that period.

Outside the delta areas insurance companies made few farm loans in Louisiana, Arkansas, and Mississippi, but the land bank was fairly active. In the late twenties and early thirties the land bank acquired a considerable number of farms in the upland areas of northwestern and southeastern Louisiana, but losses were comparatively small (Figures 9 and 10, Chapter 1). In the upland areas of Arkansas, land bank foreclosures and losses were heavy except in a small group of counties in the northwestern part of the state, a group of oil-producing counties along the southern border, the rice-producing county in the east central part of the state, and the urban counties of Saline and Pulaski in the central part.[19] In Mississippi, land bank foreclosures and losses in upland areas were heavy except in the east central and southern parts of the state.

Severe boll weevil damage had occurred relatively early in

[18] *Ibid.*, p. 62.

[19] The city of Little Rock is located in Pulaski county and the city of Benton in Saline county.

Louisiana.[20] In southern Louisiana, where climatic conditions favored the weevil, a shift was made to rice, truck crops, and some livestock. In the uplands of northern Louisiana the boll weevil could be combatted more successfully, and as methods of control were developed, cotton acreage again expanded in that part of the state.[21] It appears, however, that adjustment problems during the decade 1910-20 acted as a restraining influence on both farm land values and debt in Louisiana, with the result that farmers' financial difficulties during the interwar period were not so severe as in many other parts of the South. The leasing and development of oil lands in the western part of the state in the twenties and thirties also undoubtedly provided income that helped meet many farm mortgage payments.

In the cotton and general farming sections of Arkansas outside the delta cotton acreage was expanded during the World War I period, as in other parts of the South.[22] It is probable that both farmers and lenders misjudged the long-term profit possibilities of producing cotton in upland parts of the state, where much of the land is of relatively low productivity. When cotton prices declined, many farmers in low-yield localities found it impossible to meet their loan obligations. With the exception of the few counties previously mentioned, land bank foreclosure and loss rates were high in the upland areas of Arkansas.

Debt distress was especially severe during the early thirties in the upland as well as the delta areas of Mississippi, with the exception of relatively small sections in the east central and southern parts of the state (Table 19; Figures 9 and 10 in Chapter 1). In the latter areas are many small-scale subsistence farms on cut-over timber lands. Insurance companies made no loans there, and the land bank did so on a highly selective basis. Another factor that may have caused slightly better experience in the southern part of the state was the appearance of the boll weevil before World War I. This resulted in a shift from complete dependence on cotton into other farm enterprises, including livestock.[23]

[20] The boll weevil had covered most of the state by 1907.

[21] *Louisiana Agriculture, Progress and Opportunities* (Louisiana State University and Agricultural and Mechanical College, Division of Agricultural Extension. Circular 89, Part 1, July 1926), Table 17, p. 114 f.

[22] *Types of Farming in Arkansas* (University of Arkansas, Research and Extension Staff of the College of Agriculture, Circular 351, June 1936).

[23] *Types of Farming in Mississippi*, by M. A. Crosby (Bureau of Agricultural Economics, mimeo., January 1940).

In the Black Prairie section of northern Mississippi, soil fertility had declined somewhat by the twenties as the result of continuous cropping. The boll weevil also contributed to reduced yields. The main factor causing distress, however, was not so much productivity as almost complete dependence upon cotton in a period when cotton prices were low.

TEXAS AND OKLAHOMA

The high plains of west Texas near the eastern border of New Mexico form the western boundary of the Cotton Belt (area VII-A1 on the color map) as traditionally defined. South and west of the Texas cotton area is a vast range livestock area with year-long grazing. To the north is the wheat, sorghum, and range livestock section of the southern High Plains.

On the whole, experience with land bank and insurance company loans was much better in Texas than in states to the east (Figures 6, 7, 9, 10, 13, and 23, Chapter 1). Shrinkage of commercial bank deposits during the interwar period was also relatively low (Figures 17 and 18).

Within Texas there is wide diversity of physical conditions that affect agricultural production and prosperity. Soils range from dune sand to heavy clay, topography varies from rough and broken to level, and annual average rainfall ranges from 50 inches in the southeastern corner to 10 inches in the far west. These factors make possible many different types of farming, ranging from the production of subtropical fruits and a wide variety of vegetables in the southern tip of the state to large-scale wheat farming in the northwest, and from crop farming under humid conditions in the east to semiarid farming and extensive livestock ranching in the west.[24]

Farming in Texas is heavily concentrated on the Grand and Black Prairies, which form a strip running from north to south about a third of the way across the state from the eastern edge (area VII-A2 on the color map). The soils there are mostly dark calcareous clays, high in natural fertility. Rainfall averages 30 inches or more. Although corn is important, the area—particularly the Black Prairie section—specializes to a high

[24] For a brief description of characteristics and trends of the major cotton production areas in Texas see *Changes in Cotton Production in War and Peace*, by E. L. Langsford (Bureau of Agricultural Economics, F.M. 45, December 1944); also *A Description of the Agriculture and Type-of-Farming Areas in Texas*, by C. A. Bonnen and B. H. Thibodeaux (Agricultural and Mechanical College of Texas Agricultural Experiment Station, Bulletin 544, June 1937).

degree in cotton. Lending both by the land bank and by insurance companies was comparatively heavy in the prairie strip, and foreclosure rates were the highest in the state. Land bank loss rates in the black lands, although lower than in many other parts of the United States, were much higher than in east or west Texas (Figure 10, Chapter 1). Insurance company losses were also comparatively high (Figure 35). In the northern part of the prairie area there were numerous bank failures during the twenties and early thirties (Figure 16).

The basic cause of debt distress in the black land area of Texas appears to have been low cotton prices, especially in the thirties. A contributing factor in some localities was reduced yields resulting from continuous cropping, water erosion, and root rot. In recent years, as a result, there has been some shifting to feed crops, pasture, and livestock production.

Although farm foreclosure rates in the black land area were high compared to those in other parts of Texas, they were lower than those in many specialized cotton-producing areas in states to the east. The early appearance of the boll weevil in Texas allowed time to cope with it before the decline in cotton prices in the early twenties and thirties. In fact the presence of the weevil in the central Texas cotton section before 1910 may have tended to restrain the rise in land values and mortgage debt during World War I, when cotton acreage was expanding and the price of cotton was rising.

In eastern Texas, soils are sandy and there is much cut-over timber land. Before 1925 cotton acreage increased rapidly, but in view of poor production conditions it later contracted. Insurance companies made few loans in the sandy section, and the land bank followed a conservative lending policy. Other lenders, however, apparently were less cautious. In Hardin county—a WPA sample county in a poor agricultural section of southeastern Texas—the number of distress farm transfers during the period 1920-35 totaled more than 100 percent of the estimated number of mortgaged farms in 1930 (Figure 8, Chapter 1). The bulk of the foreclosures occurred in 1927 and 1928.

West of the Black Prairies of Texas, annual rainfall diminishes and lack of moisture constitutes one of the major production hazards. Notwithstanding the production risks involved in the dry area, it appears to have experienced less farm mortgage distress during the interwar period than any other large section

of the South. In fact western Texas has been delineated as one of the few parts of the United States where all data—insurance company and land bank foreclosures and losses, commercial bank suspensions and deposit changes, and distress transfers of farms—point to generally excellent farm loan experience (Figure 23, Chapter 1).

The low rate of foreclosures in western Texas may be in part the result of conservative lending practices during the World War I and interwar periods. The main reason, however, is that the types of farm and ranch operations carried on there are well suited to the arid and semiarid climate of the region. Apparently little effort was made to break up the land into small crop-farming units as was done in the northern part of the western Great Plains. Furthermore, as has been pointed out, the cotton-producing sections of western Texas have several production advantages over the eastern Cotton Belt, where farm debt distress was especially severe. The dry climate of the plains is particularly helpful in restricting boll weevil damage, which was so great during the twenties in the humid cotton areas farther east. Although yields are comparatively low and much of the cotton grown on the plains of Texas and Oklahoma is not of high quality, topography and climate are such as to make possible the adoption of large-scale, low-cost production methods.[25] Cotton acreage in west central Texas expanded rapidly after 1915. The upward trend continued into the middle thirties, even during periods when agricultural prices were low and cotton acreages were declining in the eastern Cotton Belt. During the twenties, while land values in most parts of the country were declining, in western Texas they continued to increase (Figure 19, Chapter 1).

In Oklahoma the geographic variations in soil, topography, and rainfall are similar in some respects to those of Texas. Average annual rainfall ranges from 45 inches in eastern Oklahoma to less than 20 inches in the western panhandle. Much of the western half of the state consists of open prairies with a fairly productive red soil. The eastern half of Oklahoma, on the other hand, is much rougher, with the Ozark mountains ex-

[25] See Langsford's report, cited above; also *Information Basic to Farm Adjustments in the High Plains Cotton Area of Texas*, by A. C. Magee, C. A. Bonnen, and B. H. Thibodeaux (Agricultural and Mechanical College of Texas Agricultural Experiment Station, Bulletin 652, July 1944), and, by the same authors, *An Economic Study of Farm Organization and Operation in the High Plains Cotton Area of Texas* (Bulletin 568 of the foregoing station, January 1939).

tending well into the southeastern part of the state. Wheat farming predominates in the northwest, cotton in the southern half, and grazing and general farming in the northeast. There is also a small fruit and mixed farming area on the Ozark plateau, which extends into northeastern Oklahoma.[26]

Farm mortgage distress in western Oklahoma during the interwar period was closely associated with variations in rainfall. A number of counties there were in the Dust Bowl, which developed in the mid-thirties under a series of droughts. Losses on Commissioner loans (direct government loans of an emergency character) were especially high (Figure 11, Chapter 1). Before the drought years of the thirties, debt distress in western Oklahoma had been relatively small. Since 1940, with generally favorable weather and high agricultural prices, that section of the state has made a rapid financial recovery.

In eastern Oklahoma the land bank and the insurance companies, as well as the Land Bank Commissioner, acquired large numbers of farms by foreclosure during the interwar period, and sustained heavy losses (Figures 9-13, Chapter 1, and Figure 35). In Latimer county, a WPA sample county in southeast Oklahoma, the number of distress transfers between 1920 and 1935 was greater than the number of farms mortgaged in 1930 (Figure 8). Bank failures in eastern Oklahoma were also high (Figure 16).

The productivity of the soils in much of eastern Oklahoma is generally low, and the topography is rough. During World War I, when agricultural prices were high, farmers planted crops—principally cotton—on large acreages of land that normally should have remained in pasture and woods. In the twenties much of that land was abandoned. A complicating factor in the east was the small size of the typical farm. In southeast Oklahoma, with a history of land grants to individual Indians rather than to the tribe, 40 acres was the most common size of farm in the twenties. Efficient, low-cost operation was impossible on such small units. In contrast, the most common sizes of farms in the midwestern and western parts of the state were 160 and 320 acres respectively.

The question arises why lenders misjudged farm loan risks

[26] For a more detailed description see *Types of Farming in Oklahoma*, by J. O. Ellsworth and F. F. Elliott (Oklahoma Agricultural and Mechanical College Agricultural Experiment Station, Bulletin 181, June 1929).

in eastern Oklahoma. Possibly it was because crop farming was comparatively new in that area during World War I. Cotton was profitable for a time, and only after prices fell was it realized that with prices that could be expected in ordinary years the area was marginal for cotton production.

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OTHER AREAS: DAIRYING, TRUCK AND FRUIT, TOBACCO, AND GENERAL FARMING

The Northeast

THE Northeast (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania), like the eastern Cotton Belt, is one of the earlier-settled sections of the country, and its agriculture, too, has faced substantial competition from newer areas. On the whole, however, adjustments appear to have been less difficult in the Northeast than elsewhere, and although they continued throughout the interwar period, agriculture probably suffered less there during the twenties and thirties than in most other sections of the country.

Fundamentally, the greater part of the Northeast is best suited to the production of grass—the basis of the region's dairy industry. The climate is cool and moist. Over wide areas soils are heavy, acid in reaction, and imperfectly to poorly drained. In addition, some of them are thin and stony. Much of the topography is too rough and hilly to permit efficient use of modern farm machinery. There are, of course, important areas with well-drained soils and level to gently rolling topography that are well adapted to crop production.

During the period of settlement and until about 1880 the Northeast produced a wide variety of agricultural products. But as newer and better farming areas developed in the West, northeastern farmers found themselves at a competitive disadvantage in producing the more concentrated agricultural products such as grains, meat, cheese, butter, and wool. Furthermore, as agricultural technology and transportation facilities improved, this competitive disadvantage increased. Northeastern agriculture met the new competition in two ways: first, by shifting population out of farming entirely or into part-time farming; second, by concentrating on those products in the production of which the region still enjoyed a comparative advantage. The adjustment of northeastern agriculture was greatly facilitated by the expansion of business and industry in the region.

One of the major effects of industrialization on northeastern

agriculture was the provision of nearby nonfarm job opportunities. Many farmers on marginal land were able to find work in the growing towns and cities. Some remained on their farms, terminating their farming operations entirely or reducing them to a part-time basis; others actually abandoned their farms. With the improvement of transportation facilities, particularly the automobile and the all-weather road, many farmhouses once abandoned were repaired and reoccupied by nonfarm workers, and new homes were built in the open country. As a result the substantial decrease in the farm population, particularly during the decade of the twenties and again in the forties, was more than offset by an increase in rural nonfarm population. This had a stabilizing effect on land values.

A second major impact of industrialization on the agriculture of the Northeast was the expansion of markets for certain bulky, perishable products that are fairly well adapted to the soils and climate of the region. Of these fluid milk is the foremost, but poultry, eggs, fruits, and vegetables are also important. Except for a few areas where soils and climatic conditions are especially well suited to the production of specialty crops (principally fruits and vegetables), most farmers in the Northeast are engaged in dairying, either as the sole enterprise or combined with poultry or cash crops (see color map). One of the specialized crop areas is Aroostook county, Maine, where a cool climate, a long growing season, adequate and regular rainfall, and well-adapted soils encourage intensive potato production. Another such area is that along the southern shores of Lake Ontario and Lake Erie, where deep, well-drained soils and climate tempered by the lakes provide excellent conditions for orchards and vineyards. Finally, some of the sandy soils of the New Jersey coastal plain are well suited for truck farming.

Partly because of excellent nearby markets and partly because of the type of farming engaged in, prices received by farmers in the Northeast were somewhat more stable during the interwar period than in many other parts of the United States.[1] Although agricultural prices during the World War I period rose in the Northeast as much as in most major regions,

[1] During the depression years 1930-34 the index numbers of prices received by United States farmers for dairy products averaged 105 (1910-14 = 100). Indexes for poultry and eggs averaged 94, for fruit 98, and for truck crops 104. The average for all livestock products was 91 and for all crops 84. See *The Agricultural Situation* (Bureau of Agricultural Economics), Vol. 37, No. 1 (January 1953), page 15.

the subsequent decline was much less severe. In fact the index of farm prices in the Northeast remained above the United States average for the entire interwar period.

The farm real estate market in the northeastern states also exhibited great relative stability. In the high year 1920, farm real estate values had risen only 37 percent above the 1912-14 level, whereas the United States average had risen 73 percent.[2] Mortgage debt also rose moderately in the Northeast during the World War I period, increasing only 78 percent from 1910 to the peak year, 1923,[3] while there was a 236 percent rise for the United States as a whole. When land values declined after World War I, the decrease by 1933 averaged only 26 percent for the Northeast, as against 57 percent for the entire nation.

On the whole, mortgage experience in the Northeast was good to excellent. Statewide distress transfer rates per thousand farms during 1925-39 were low for all the nine states in the region. Indeed, four of the states—Massachusetts, Rhode Island, New Hampshire, and Connecticut—had the lowest rates in the entire nation (Figure 6, Chapter 1). There were few bank suspensions in the Northeast during the twenties (Figure 16), and bank deposits either increased, or decreased relatively little, over most of the region during 1920-33 (Figure 18). Banking statistics, to be sure, do not reflect agricultural conditions in the Northeast so well as in many other parts of the country, because in all but a few areas, such as Aroostook county, Maine, business and industry dominate the commercial banking picture.

Since insurance companies did very little farm mortgage lending in the Northeast during the interwar period, their experience is hardly significant. But the land banks did a good deal of business, and their foreclosure and loss rates (Figures 9 and 10, Chapter 1) show considerable variation in mortgage experience within the region. In general, experience was quite good, especially loss experience, in the area designated A in Figure 23 and comprising southern New England, the Hudson River valley, northern New Jersey, and eastern Pennsylvania.

[2] *The Farm Real Estate Market* (Bureau of Agricultural Economics), July 1953, Table 9, pp. 22 f.

[3] Donald C. Horton, Harald C. Larsen, and Norman J. Wall, *Farm-Mortgage Credit Facilities in the United States* (Bureau of Agricultural Economics, Misc. Pub. No. 478, 1942), pp. 219 f.

Western New York and northwestern Pennsylvania had relatively poor experience, as did most of southern and central Maine. In Aroostook county (northern Maine) land bank foreclosures were heavy but losses comparatively small. Commissioner losses were heavy there, however (Figure 11).

The relatively good experience in areas adjacent to Boston, New York, and Philadelphia is primarily the result of proximity to great centers of population. The metropolitan centers provide excellent markets for farm products, many oportunities for off-farm employment, and an active demand for farms to be used as rural residences.

In central and southern Maine, where land bank experience was poor, soils are not very productive and much of the topography is rough. Although fairly prosperous in times of high prices, the agriculture in most of the area has been declining for the past half century. That the long-term trend was not always recognized probably constitutes the main explanation for the relatively heavy foreclosure and loss rates by the land bank on its early loans.

Aroostook county, the specialized potato-producing section of northern Maine, is identified as area IX-C1 on the color map. Unstable potato prices, accentuated by the long distance from markets, constitute a high risk factor.[4] With heavy land bank foreclosures, losses were nevertheless moderate during the interwar period (Figures 9 and 10, Chapter 1). It was on Land Bank Commissioner loans, which were made after 1933, that loss rates were relatively high (Figure 11). During the early and middle thirties, when there were several successive years of low prices, mortgage distress was severe.

The southern tier of counties in western New York and the adjoining counties in northern Pennsylvania are illustrative of an early-settled area where farm mortgage distress resulted mainly from a failure to foresee the difficulty agriculture would have in adjusting to changing competitive conditions. Until near the end of the nineteenth century the farmers of that area, which lies in the foothills of the Alleghenies, were making a fair living by selling their milk to local butter and cheese factories. In addition they sold some hay, potatoes, and other crops to supplement their dairy income. But strong competi-

[4] For a discussion of the economic problems of potato producers, see *Farm Credit in Aroostook County, Maine*, by Charles H. Merchant (University of Maine Agricultural Experiment Station, Bulletin 418, April 1943).

tion, beginning about 1880, developed from the Lake states in butter and cheese production, and from the Corn Belt and the more productive parts of the Northeast with other agricultural commodities. Then, between 1910 and 1920, the development of automotive power began to reduce the demand for cash hay. All this bore heavily on the hill farmers of southern New York and northern Pennsylvania. Their plight was aggravated, moreover, by heavy acid soils suited only to a limited range of crops, by rough topography unsuited to the use of modern farm machinery, and by inaccessibility during much of the year due to poor roads. Many unproductive hill farms were abandoned. As late as the decade between 1920 and 1930 the acreage in farms in both New York and Pennsylvania decreased approximately 13 percent.[5] The largest acreage abandoned was in the Allegheny plateau of southern New York and northern Pennsylvania.

Loan experience was poor not only in the southern tier of counties in western New York but also in the section lying between them and Lake Ontario (areas I-B6 and IV-D2 on the color map). It is a section of generally much better farming country than the Allegheny plateau, with substantial acreages of land well adapted to the production of cash crops as well as to dairying. Fruit growing is important along the south shore of Lake Ontario, and elsewhere such cash crops as cabbage, potatoes, fresh vegetables, canning crops, dry beans, and wheat are common. Prices received by farmers for most of these crops are subject to wide fluctuations, whereas the cash costs of production are usually substantial and relatively inflexible. Farm incomes therefore fluctuate violently, which often leads to debt difficulties. A further important factor contributing to debt difficulty in the western New York cash crop area is wide variations in soil, which often occur within short distances. In the vicinity of productive land, farmers and appraisers have frequently overrated the debt carrying capacity of soils not well suited to the production of the crops commonly grown in the area. The hazard is especially serious in the case of intensive crops with heavy annual cash costs of production.

Appalachian States

The seven states Tennessee, Kentucky, North Carolina, Virginia, West Virginia, Maryland, and Delaware form a region

[5] 16th Census: 1940, *Agriculture*, Vol. 3, Table 18, pp. 53 f.

whose main physical feature is the Appalachian mountains and where general farming is the characteristic type. Soils of the region range from the sandy soils of the coastal plain and the thin, unproductive soils of the mountain areas to the fertile lands of the blue grass section of north central Kentucky. Length of growing season varies from more than 250 days in parts of the tidewater area of North Carolina to less than 150 days in the northern part of the mountainous area that extends northeastward through the region from eastern Tennessee and western North Carolina into southwestern Pennsylvania. Rainfall, which averages from 30 to 55 inches annually, is generally adequate for crop production.[6]

The color map shows several specialized types of farming in the Appalachian region—cotton, tobacco, dairy, fruit, and truck. General farming predominates, however, including livestock-tobacco, livestock-dairy, and truck-livestock-tobacco combinations. There is also a large area in the Appalachian mountains devoted to small-scale farming of a largely self-sufficing type.

Although distress transfers per thousand farms were below the United States average in all seven of the Appalachian states (Figure 6, Chapter 1), distress transfers per thousand *mortgaged* farms were above the United States average in five of the states (Figure 7). In particular, North Carolina and Virginia were rather substantially above the average. Yet there were no large areas of severe debt distress such as existed in the Great Plains and Mountain region and in the Corn and Cotton Belts. This was due in part to the prevalence of small-scale, largely self-sufficient farms that neither require much credit nor are considered good credit risks by institutional lenders. The highest loss and foreclosure rates in the region appear to have been in some of the specialized tobacco, fruit, and vegetable sections where cash operating costs per acre are high and prices received for the commodities produced are extremely variable (Figures 8-13). Also there were debt troubles in the fringes between productive and unproductive farming areas, where it is not uncommon to make mistakes in loan appraisals.

Western Kentucky and several adjoining counties in northwestern Tennessee accounted for much of the farm mortgage distress occurring in those two states. The difficulties were prob-

[6] *Climate and Man*, Yearbook of Agriculture, 1941 (U.S. Department of Agriculture).

ably connected with specialization in western fire-cured and other types of export tobacco. During the twenties the foreign market for dark tobacco declined and prices decreased sharply. The farm value of western fire-cured tobacco produced in Kentucky dropped from over $12 million in 1919 to an average of $4.4 million in the twenties and to an average of only $1.5 million in the thirties.[7] Experience with insurance company loans indicates that there was considerable farm mortgage distress in western Kentucky as early as 1929 (Figure 12).

In the heart of the blue grass area of north central Kentucky and in the Tennessee central basin there were relatively few farm foreclosures and distress transfers (areas VIII-B1 and VI-J1 on the color map). Conditions in the two areas are quite similar.[8] Soils and climate are suited to a variety of farm enterprises including livestock, dairy, tobacco, corn, and wheat. Burley tobacco, a very important crop in both sections, is raised primarily for domestic markets and did not experience the sharp price decline of the dark tobaccos. In localities in the Tennessee basin specializing in cotton, however, and in the less productive counties on the edge of the basin, some foreclosures by insurance companies occurred.

The cotton-producing section of western Tennessee had favorable experience with land bank and insurance company loans, as compared to other sections of the central and eastern Cotton Belt. Its topography is undulating to rolling, and the silt and clay loams are generally productive. Markets and transportation facilities are good. The fact that western Tennessee has not been dependent on cotton alone, but has some dairy, livestock, truck, and cash grain farming, partly explains its good experience.

East of Kentucky are the limestone valleys that extend in a northeasterly direction along the eastern Tennessee and western Virginia boundaries. The experience of the land banks and of insurance companies in these valleys has generally been good. The area has few hazards of production, and wide diversity in

[7] A. J. Brown and Dana G. Card, *Thirty Years of Farm Prices and Production in Kentucky* (University of Kentucky Agricultural Experiment Station, Bulletin 403, May 1940), p. 273.

[8] For a description of Kentucky and Tennessee agriculture, see *Types of Farming in Kentucky*, by Bruce Poundstone and Walter J. Roth (University of Kentucky Agricultural Experiment Station, Bulletin 357, June 1935), and *Types of Farming in Tennessee*, by B. H. Leubke, S. W. Atkins, C. E. Allred, and W. J. Roth (University of Tennessee Agricultural Experiment Station, Bulletin 169, April 1939).

types of farming helps to spread the price risk. Land values neither increased as much during World War I nor declined as much in the subsequent deflation as they did in many places where farming was more specialized. The character and background of the people who settled the area, many from Pennsylvania, have been in large part responsible for the generally good soil-conserving practices that are followed—a sharp contrast to the exploitive agriculture that was traditional in the cotton- and tobacco-growing sections of North Carolina and Virginia.

There was some farm mortgage distress in the central and eastern portions of North Carolina and Virginia. Flue-cured tobacco is produced in an important specialized crop area in the central coastal plains and piedmont of North Carolina extending northward into south central Virginia. Farmers in the area did fairly well during the twenties, when the price of tobacco held at about 20 cents per pound, but an appreciable volume of mortgage distress developed in the early thirties when the price dropped to 8 and 10 cents per pound.[9] In east central Virginia, where there are many sandy soils of low productivity, the land banks experienced some losses. Heaviest land bank losses, however, were in the Norfolk section of Virginia and in the southern half of the Delaware-Maryland-Virginia peninsula. These areas specialize in the production of truck crops and potatoes, both of which are subject to wide year-to-year price fluctuations with only small changes in production costs. In the two counties near Norfolk extensive land drainage systems, involving high tax assessments and heavy upkeep expense, were a further factor contributing to debt difficulties.

The relatively good farm mortgage experience in northern Virginia and north central Maryland was due largely to the proximity of urban Washington and Baltimore, whose expanding markets, particularly for fluid milk, helped to sustain agricultural incomes during the depression years.[10]

Florida

In northern Florida, where cotton and general farming pre-

[9] *Agricultural Outlook Charts—1950* (Bureau of Agricultural Economics, 1949), p. 79.

[10] For a description of agriculture in Maryland see *Types of Farming in Maryland*, by A. B. Hamilton and T. D. Johnson (University of Maryland Agricultural Experiment Station, Bulletin 432, February 1940).

dominate, farm mortgage experience appears to have been similar to that in sections of the Cotton Belt immediately to the north, which has been discussed in Chapter 4. Here we shall be concerned only with the experience in the remainder of the state, where agriculture concentrates primarily on fruit and truck crops. Sales of fruit and vegetables amounted in 1944 to approximately 65 percent of the total value of Florida farm products sold.[11]

In contrast to the United States as a whole, Florida had one of its periods of greatest expansion during the 1920's, particularly in citrus and truck farming. In 1924 farm real estate values began to increase and by 1926 they had risen 25 percent above the 1920 level.[12] Thereafter land values in Florida declined, but when the low point was reached in 1933 they were still above the 1912-14 average and were higher in relation to the postwar peak than were values in the country as a whole. Farm mortgage debt, too, increased spectacularly in Florida during the mid-twenties, more than tripling between 1925 and 1927.[13] By 1933 such debt had declined nearly 60 percent from the 1927 peak but was still nearly twice the 1920 level.

Despite the sharp increase in total farm mortgage debt that accompanied the Florida real estate boom of the mid-twenties, and the heavy liquidation of debt that followed, the average annual number of distress farm transfers per thousand farms during the period 1925-39 was considerably lower in Florida than in the United States generally (Figure 6, Chapter 1). Moreover, the number of distress farm transfers per thousand farms *mortgaged* in 1930 was also lower than in the United States as a whole (Figure 7). There was, of course, considerable variation in farm mortgage distress both in different parts of the state and among different lenders. Insurance companies held too few farm mortgage loans in Florida during the interwar period for their experience to be significant. Land bank and Commissioner loan experience was somewhat less favorable than would be expected in view of the generally low rate of distress farm transfers in the state.

The Hastings early potato section of northeastern Florida, in which experience with land bank and Commissioner loans

[11] *Census of Agriculture: 1945*, Vol. 2, pp. 590-93.
[12] From a release by the Bureau of Agricultural Economics, September 1953.
[13] Horton et al., *op.cit.*, pp. 220 f.

was relatively poor, is a high risk section that must market its crop within a short period of time to avoid ruinous price competition with other areas. If the Hastings potato crop is much earlier than usual it competes with the last of the southern Florida crop; if it is later than usual it competes with the first of the Alabama and Georgia potato crops. Variations in the growing season sometimes cause wide year-to-year price fluctuations, and in years of low prices losses may be quite heavy, since production costs are relatively high and inflexible. Another northern Florida area in which land bank loan experience was poor is the group of counties in the western part of the state just north of Tampa. A vegetable-growing section, it has experienced increasing difficulty in competing with newer vegetable-producing areas farther south that have better soils and a more favorable climate.

Relatively few loans were made by the land bank in the southern half of Florida in the twenties and up to 1933. Throughout much of that period, land bank loans on citrus groves were based primarily on the value of the land for general agricultural purposes, without regard to the value of existing trees or to the additional value of the land because of its suitability for citrus production. This conservative lending policy restricted both volume and losses up to 1933. In that year the land bank began allowing mortgage loans on citrus groves to be based on the value of the land for citrus production. The change in policy, together with the urgent demand for refinancing that existed at the time, resulted in a considerable volume of land bank and Commissioner loans in the southern half of Florida during 1933-35. Losses on Commissioner loans, which were of an emergency character and usually less well secured than regular land bank loans, were quite heavy (Figure 11, Chapter 1). The high loss rates resulted partly from low prices for citrus fruit during much of the thirties and partly from a severe freeze in December 1934, which killed or damaged large numbers of citrus trees.

Lake States

The Lake states—Michigan, Wisconsin, and Minnesota—include a wide range of climate, soils, and topography.[14] For the

[14] For detailed descriptions of agriculture in the Lake states, see: *Types of Farming in Michigan*, by E. B. Hill, F. T. Riddell, and F. F. Elliott (Michigan State College Agricultural Experiment Station, Special Bulletin 206, December

most part this is a region of cool summers and cold winters. Rainfall is moderate and largely concentrated during the growing season. Topography varies from nearly level to rough, and soils are highly variable, as in all glaciated areas. The region produces a wide variety of crop and livestock products, but sales of dairy products are the largest single source of income.

The main dairy belt in the Lake states occupies most of the southern half of the region.[15] To the north of the dairy belt, and covering roughly the northern half of the three states, is the cut-over country (areas marked IV-C1 on the color map). Along the eastern shore of Lake Michigan there is a fruit, truck, and mixed farming section. The southwestern part of Minnesota is an extension of the Corn Belt, producing cash grain and livestock. The Red River valley of northwestern Minnesota is an extension of the Great Plains, with wheat and general farming.

Farm mortgage distress in the Lake states was quite severe during the interwar period. Northern and central Minnesota, a large part of Wisconsin, and Upper Michigan (extending eastward from the northern Wisconsin border) constituted one of the major farm mortgage trouble spots in the country (Figures 9-13 and Figure 23, Chapter 1). In contrast, experience in southern Minnesota, southeastern Wisconsin, and Lower Michigan was relatively good.[16]

Conditions affecting farm mortgage experience in the north-

1930); *Forces Affecting Wisconsin Agriculture with Resulting Types of Farming*, by P. E. McNall and W. J. Roth (University of Wisconsin Agricultural Experiment Station, Research Bulletin 131, November 1935); and *Agricultural Production and Types of Farming in Minnesota*, by Selmer A. Engene and George A. Pond (University of Minnesota Agricultural Experiment Station, Bulletin 347, May 1940).

[15] That is, all of the dairy region of the Lake states as delineated on the color map except the areas designated as IV-C1, "Lake states, cut-over, small-scale." It should be kept in mind that many different crop and livestock enterprises are carried on in the dairy belt, usually, however, in combination with dairying.

[16] Insurance companies made few if any loans in the cut-over areas. In other parts of the Lake states, including southern Minnesota, southern Wisconsin, and the south central part of Lower Michigan, distress ratios were high in a number of counties at the end of 1932 (Figure 13). Losses, however, appear to have been small. During the period 1929-37 thirteen life insurance companies for which data have been made available sold acquired Lake state properties in which they had an investment of $16.6 million at time of sale. Losses averaged slightly less than 2 percent of that amount. (Investment at time of sale includes capital investment at time of acquisition plus maintenance, improvements, and taxes, less income.)

western and southwestern sections of Minnesota were similar to those discussed in Chapters 2 and 3 dealing with the Great Plains and the Corn Belt. It is mainly to the cut-over and commercial dairy sections of the Lake states that attention will be directed here.

CUT-OVER COUNTRY

The cut-over country, one of the more recently settled sections of the United States, is a distinctive feature of the Lake states. From the standpoint of agricultural production it is not very important. Only a small proportion of the land is in farms, and a small-scale agriculture, partly subsistence in character, predominates. Originally the region was covered with heavy stands of pine, cutting of which extended well into the twentieth century. The peak period of settlement of the cut-over areas in Lower Michigan had been reached by 1910 or earlier. In the cut-over areas of Upper Michigan, Wisconsin, and Minnesota, however, land in farms was still increasing in the decade between 1910 and 1920 (Figure 26, page 64), and settlement continued into the middle twenties.

Much of the once-forested area looked productive, land was lower-priced than in the Corn Belt, and there was a large amount of promotional activity by real estate and lumber interests. During most of the period of settlement, production conditions were good, agricultural prices, particularly for dairy products, were high, and farm land values were rising—all of which stimulated a rush of settlers to the area. Before long the settlers learned that the cut-over country had serious limitations. Removing stumps and stones, constructing buildings, and stocking with livestock often required several years and a substantial cash outlay.[17] The high degree of variability in climate, topography, and especially soil resulted in many mistakes in settlement. Soils of both good and poor quality are found within relatively small areas in the cut-over region—sometimes on the same farm. Hartman and Black state: "One of the chief mistakes made by settlers is to judge the productivity of sandy soils too much on the basis of crops grown or growing in years or seasons when there is an abundance of rain. Likewise, heavy

[17] For a good description of the physical and economic characteristics of the area see *Economic Aspects of Land Settlement in the Cut-Over Region of the Great Lakes*, by W. A. Hartman and J. D. Black (U.S. Department of Agriculture, Circular No. 160, April 1931).

soils are judged during dry seasons when the lack of drainage is not so noticeable."[18]

It is not surprising that farm mortgage distress was severe in the cut-over country during the interwar period. Although insurance companies made loans only on the fringes of the area, a high proportion of such loans were in difficulty by the end of 1932 (Figure 13, Chapter 1). The Minnesota Department of Rural Credit suffered heavy losses, especially in central Minnesota, and also in the northern cut-over area. The total loss to the state at the end of 1945 was approximately $39 million, or nearly two-thirds of the amount originally loaned.[19] Both land bank and Commissioner foreclosures and losses were heavy in the cut-over country of Upper Michigan and northern Wisconsin (Figures 9-11). They were somewhat less severe in the cut-over areas of northern Minnesota and Lower Michigan.

The variations in distress within the cut-over sections of the Lake states are related basically to the time of settlement. Lower Michigan, where experience was relatively favorable, had been settled early, and by World War I it was generally recognized that the northern part was of little agricultural value. This helped to prevent the expansion of debt which occurred in many other cut-over areas. Another section where debt distress was less acute was in the most northern section of Minnesota, the last part of the state to be settled. When settlers arrived, there had been sufficient experience elsewhere to make both farmers and lenders more cautious with respect to farm mortgage debt. Further, it is probable that soils in north Minnesota were on the whole basically more productive than those of northern Wisconsin and Michigan and that farming was attempted only in the better parts of the area.

[18] *Op.cit.*, p. 18.

[19] From *Sales, Collections and Operating Statistics, January 1, 1945 to December 31, 1945*, a report of the Department of Rural Credit of the state of Minnesota. The Department of Rural Credit was created by act of the legislature in 1923. It was authorized to make first mortgage loans on improved or partially improved farm land in amounts ranging from $500 to $15,000. The law provided that loans should be limited to 50 percent of the appraised value of the land plus 30 percent of the appraised value of the buildings, the latter not to exceed $8,000 or 50 percent of the value of the land.

By 1933, when liquidation of the agency was ordered, some $60 million had been loaned. Loan funds were obtained by the sale of securities to investors. These securities were obligations of the state. See Rural Credit Act, Minnesota Laws, 1923, Chapter 225.

COMMERCIAL DAIRY BELT

The commercial dairy belt of the Lake states was settled earlier than the cut-over region, is more accessible, and contains areas of much better farming land. Yet the dairy belt experienced widespread farm mortgage distress during the interwar period, parts of it having even more serious difficulties than the cut-over country. In general, financial distress stemmed from the large increase in debt that accompanied the expansion of the dairy industry during and just after World War I. Debt was incurred to purchase farms, increase dairy herds, construct buildings, and clear and improve additional land, in many cases without proper consideration for the productive limitations that existed in much of the area. Productivity varied greatly, and the fertility of the thin forest soils prevalent in many sections was easily depleted except under the most careful management. When agricultural prices declined, particularly in the early 1930's, areas where productivity had been overestimated had many mortgage foreclosures.

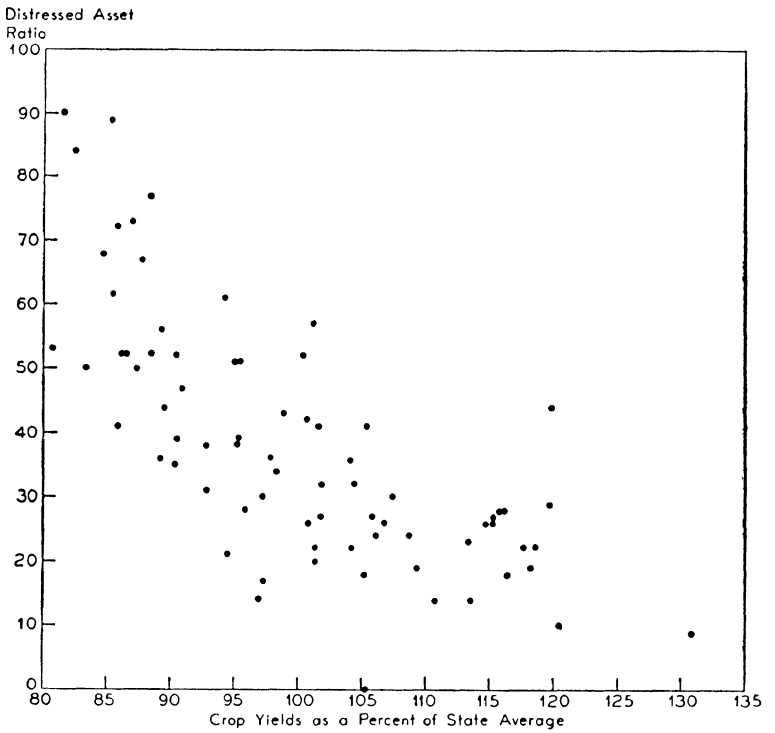
In central Minnesota and central and western Wisconsin there is a belt of counties south of the cut-over area in which land bank, insurance company, and Commissioner loan experience was poor (Figures 9-13, Chapter 1). Soils in substantial areas of central Minnesota are sandy and of low productivity. Rainfall varies from slightly more than 20 inches in the western part of the state to between 25 and 30 inches in the eastern part (Figure 25). Engene and Pond have computed indexes of the amount and variability of crop yields during the period 1918-42 for each county in Minnesota.[20] The highest and most stable yields were in the south central part of the state, and there loan experience was good. The lowest and most variable crop yields were in the western counties and in parts of central Minnesota, and there loan experience was poor. The relationship between crop yields and foreclosure rates on insurance company loans is indicated in Figure 36 for all counties except those in the northeastern cut-over section where the insurance companies made few loans. Evidently lenders did not properly appraise differences in productivity resulting from differences in soils and rainfall during the period under review. Central Minnesota has

[20] Selmer A. Engene and George A. Pond, *Agricultural Production and Types of Farming in Minnesota* (University of Minnesota Agricultural Experiment Station, Statistical Supplement to Bulletin 347, revised, June 1944), Tables 1 and 2, pp. 4-7.

an intermixture of good and poor soils, which makes accurate appraisals difficult.

Failure to differentiate sufficiently between soils of varying productivity appears also to have been the basic cause of much of the poor mortgage loan experience in central and western

Figure 36. Relation between Crop Yields, 1918-42, and Distressed Farm Assets of 15 Life Insurance Companies, 1932, for 75 Counties in Minnesota



Distressed asset ratios for each county give the amount of assets involved in pending and completed foreclosures as a percentage of the companies' total farm investment there; see Figure 13. Crop yield indexes are from the work of Engene and Pond cited in the text.

Wisconsin. Many of the soils there have a tight subsoil and are highly acid. Others are sandy and yield poorly in dry years, as they did in the thirties. The topography of western Wisconsin, moreover, is rough and rolling, and it is possible that in appraising farms, lenders did not make sufficient allowance for the relatively large percentage of nontillable land on many of them.

In southeastern Wisconsin (area IV-A2 on the color map) land bank and insurance company foreclosure and loss rates were comparatively low. This is a specialized dairy area and perhaps the best farming section in the state. Also it is located close to two large urban centers, Chicago and Milwaukee, which provide a market for large amounts of fluid milk. Prices received by farmers for dairy products during most of the interwar period, and particularly during 1930-34, were higher in relation to the prewar level than prices received for any other major group of crop or livestock products.[21] Thus dairy farmers, especially those near a market for fluid milk, were better off during the depression years than most other groups of farmers.

Pacific Coast States

The three Pacific Coast states, Washington, Oregon, and California, have a highly diverse agriculture. Intensively farmed areas such as the Puget Sound–Willamette Valley country of western Washington and Oregon and the Sacramento and San Joaquin valleys of central California are separated by vast areas of land which, because of rough topography or lack of rainfall, are suited only to extensive uses such as forestry, range livestock production, or dry farming (see the color map). Products vary from subtropical fruits grown in the warm irrigated valleys of southern California to crops requiring a cool, moist climate such as that in the Puget Sound basin. Individual farm businesses vary from highly diversified to highly specialized, and from small-scale subsistence farms in the cut-over areas of Washington and Oregon to large-scale manager-operated farms in parts of California. With all their variations, many farms on the Pacific Coast have the common characteristic of relatively high and inflexible production costs—mainly the result of intensive cultivation on irrigated land. This inflexible cost structure appears to have been an important factor contributing to mortgage difficulty in some of the more conspicuous trouble spots that developed on the Pacific Coast during the interwar period. Mortgage difficulty was not, however, widespread in the region.

During the interwar period the Pacific Coast states experienced a very substantial growth, which undoubtedly had a stabilizing effect on the agriculture of the region. Between 1920 and 1940 the population in the three states, mainly in their

[21] *The Agricultural Situation*, Vol. 34, No. 4 (April 1950), p. 15.

western portions, increased over four million, or about 75 percent. For the United States the population increase was 25 percent.[22] Bank deposits—a good indicator of general economic conditions—were 90 percent higher in 1929 than in 1919, and even in 1934 were 58 percent above the 1919 level.[23] For the United States the comparable figures were 55 and 24 percent, respectively. In 1941, deposits in the Pacific region were 161 percent higher than in 1919, which compares with 108 percent for the country as a whole.

Loan experience in terms of distress transfers per thousand *mortgaged* farms was appreciably better in the Pacific Coast states than in the United States generally (Figure 7, Chapter 1). Within the region, however, there was considerable variation in insurance company and land bank experience. Very little mortgage distress occurred in a strip of territory along the Coast, about one hundred miles deep, which is designated D in Figure 23 (Chapter 1). On the other hand, considerable distress occurred in the eastern two-thirds of Washington and Oregon (an exception being the Palouse wheat area) and in a few scattered counties of California.

In Washington and Oregon, farming west of the Cascade mountains is located mainly around Puget Sound and in the Willamette valley (areas marked IV-E1 on the color map). In those sections, where mortgage loan experience was favorable, soils are generally fertile, rainfall is adequate, and there is a long growing season. There is also considerable diversity of farm enterprises, which include dairy, poultry, fruit, and vegetable farming. Diversification, together with an expanding population, has provided a degree of stability not shared by many specialized areas. And there were many small family farms, in the western valleys, with small out-of-pocket costs and with opportunities for supplemental off-farm income in lumbering and other local industries; among them farm mortgage distress was relatively low.

In the part of Washington and Oregon east of the Cascades, the large number of farm mortgage foreclosures resulted mainly from two factors: attempts at dry farming in areas normally best suited to grazing, and relatively inflexible production costs associated with irrigation farming and fruit production. Lying

[22] *Statistical Abstract of the United States: 1949*, p. 33.

[23] *Banking and Monetary Statistics* (Board of Governors of the Federal Reserve System, 1943), pp. 24-33.

mostly within the Columbia River basin, the area has limited rainfall, averaging from as little as 8 to 10 inches annually just east of the Cascade mountains to about 20 inches along the western border of Idaho (Figure 25, page 62).

In the dry, western portion of the Columbia River basin wheat area (marked III-A1 and III-B1 on the color map), including the section in north central Oregon, farm mortgage distress was quite severe, especially in the mid-twenties. During World War I, when wheat prices were high and rainfall was above average, considerable expansion of wheat acreage had occurred. When wheat prices declined after 1920 and yields were more nearly normal, many farmers found themselves in serious financial difficulties. There was a heavy liquidation of farm mortgage debt through foreclosure and assignments, and considerable reorganization of farms into larger holdings that could be operated at lower unit costs with large-scale farm machinery. As a result of the shakedown in the twenties, farm mortgage distress in the thirties was not particularly severe in the western part of the Columbia basin.

In the famous Palouse country, located mainly in Whitman and adjoining counties in the eastern part of the Columbia basin, both climate and soil are well suited to wheat production by dry farming methods, and yields are remarkably high and stable for an area with so little rainfall.[24] There the mortgage experience with both land bank and insurance company loans was good.

Many farms in irrigated sections of eastern Washington and Oregon experienced debt distress during the interwar period. Irrigation districts had been developed there, in the main, at relatively high cost and with large bonded debt. The heavy taxes and assessments necessary to cover upkeep and debt payments caused difficulty in periods of low prices. In some irrigated sections, particularly the lower Yakima valley, poor drainage resulted in badly waterlogged soils and lowered production.

[24] Wheat and other small grains were formerly grown in the Palouse area almost to the exclusion of other crops. In recent years, however, peas have taken up an increasing acreage. While some are grown for canning and freezing, larger quantities are sold for seed. Most of the pea seed used in the United States now comes from the Palouse region. The pea crop is grown on land which is to be summer-fallowed. It is sown in the early spring and harvested a few weeks later, after which the land is summer-fallowed and sown to wheat in the fall.

In the specialized fruit-producing Wenatchee-Okanogan[25] and Yakima areas of central Washington and the Hood River valley of northern Oregon, agricultural distress during the thirties was associated with low prices for fruit, especially apples, and high and relatively inflexible production costs. On the whole the fruit industry in the aforementioned areas had been in a healthy economic condition during the twenties. Apple prices declined drastically in 1930, however, and continued at low levels throughout most of the thirties. Production costs for labor, spray materials, boxes, and irrigation water remained at a relatively high level. According to Black and his associates, "Under normal prewar cost conditions and average yields in this area, it took about 29 cents per box to cover the cash costs, and 7 cents per box more to cover depreciation and the like. Prices in the 1920's were generally enough above this latter figure to cover these costs and leave a good return to the farmer for his management and labor and for his investment. During the 1930's, however, farm prices were below 36 cents a box in five of the years, and 29 cents in three of the years. In 1937, farm prices were 15 cents per box."[26] Some farmers, moreover, were producing varieties of apples for which there was little demand.

In California, agricultural production conditions were relatively favorable during the interwar period. Soils in the valleys, where farming is heavily concentrated, are generally good, and because of the widespread use of irrigation, crop failures are infrequent. Furthermore, climate permits the production of subtropical as well as temperate zone crops and the maturing of various fruit and truck crops in seasons when they are not produced in quantity elsewhere.[27]

The importance of California's rapid population growth and industrial development since 1920 in providing the basic economic conditions favorable to a prosperous agriculture has already been mentioned. Between 1920 and 1940 the population doubled, an increase matched by no other state. Urban employment was available to many part-time farmers, and the demand for farm products, at least those produced for local mar-

[25] See *Production, Marketing and Credit Problems of the Wenatchee-Okanogan Fruit Industry* (Farm Credit Administration, April 12, 1949).

[26] John D. Black, Marion Clawson, Charles R. Sayre, and Walter W. Wilcox, *Farm Management* (1947), p. 878.

[27] See *Types of Farming in California Analyzed by Enterprises*, by L. A. Crawford and Edgar B. Hurd (University of California Agricultural Experiment Station, Bulletin 654, September 1941).

kets, was better maintained than in many other sections of the country. Further, the influx of settlers, many of whom were Midwestern farmers in the market for farms, tended to prevent farm land values from declining seriously.

In California neither insurance companies nor federal land banks were very important lenders during the period under review. In 1930 insurance companies held only 3.7 percent and the land banks only 4.8 percent of the total farm mortgage debt in the state.[28] Thus their experience may not be as good an indicator of variations in farm mortgage distress for California as for other sections of the country. The sample of counties included in the WPA study of distress transfers also was small, and the number of distress transfers was available for only a relatively few years. But there is little doubt that mortgage experience was generally good.

Such farm mortgage distress as occurred in California during the interwar period seems for the most part to have been associated with the high degree of specialization by some farmers, especially in fruit production, and with the high level of fixed costs frequently established when farms were developed or purchased. Some operators of highly specialized farms with high fixed charges were also dependent upon distant markets and were thus particularly vulnerable in the world-wide depression of the thirties. Heavy taxes and assessments in irrigation districts were particularly troublesome during the depression. That appears to have been a major cause of difficulty in the northern end of the Sacramento valley, where insurance company foreclosures were relatively numerous. The top-heavy debt structure of irrigation districts may also partly explain the poor experience of insurance companies in the southern end of the San Joaquin valley. An additional cause there, particularly in Kings county, was wet land and the failure to evaluate drainage conditions properly in making mortgage loans.

The Imperial valley in the extreme southeastern corner of California is a third area where high irrigation costs led to serious financial difficulties among farmers during the interwar period, although poor soil drainage was also a factor and perhaps even more important. Imperial county, which was California's chief cotton-producing county in the early twenties, later shifted to

[28] Harald C. Larsen, *Distribution by Lender Groups of Farm-Mortgage and Real Estate Holdings, January 1, 1930-45* (Bureau of Agricultural Economics, mimeo., August 1945), pp. 22 and 38.

the production of winter truck crops—a highly speculative type of agriculture in which either large losses or large profits may occur.

As in every other section of the United States, a certain amount of land in California was put to agricultural uses for which it later proved to be marginal. For example, fruit production was undertaken in the foothills of the Sierras in Eldorado and surrounding counties in east central California, where soils in general are not well suited to it and the construction of irrigation systems is both difficult and expensive. Farmers there, who received early market premiums for their fruit when their orchards first came into bearing, found themselves in financial difficulties when orchards farther south came into production.

PART II

FARM MORTGAGE DISTRESS AND INDIVIDUAL FARM ORGANIZATION

6

A RESUME OF MORTGAGE EXPERIENCE STUDIES

IN PART I, which discussed geographical variations in farm mortgage distress, the smallest unit of measurement was the county, and often larger units like states or regions had to be used because needed data were not available on a county basis. Consequently, the analysis could throw little light on such variations in distress as occur among individual farms within a county, state, or region. Yet it is a matter of considerable interest—to both farmers and lenders, as well as to students of farm management—why some farm businesses experience financial distress and some mortgages break down in a region with comparatively favorable farm mortgage experience like the Northeast, or why some farms and mortgages avoid trouble in areas of relatively unfavorable experience like southern Iowa.

During the past several decades numerous sampling studies have been made for the purpose of analyzing individual farm differences in financial experience within areas where farms are of generally the same type. Some have measured farm incomes and mortgage paying ability without particular regard for actual mortgage experience. Others have dealt directly with mortgage experience, associating it statistically with soil quality, debt load, and a host of other factors. The present chapter reviews the important conclusions of nine such mortgage experience studies, whose coverage is summarized in Table 21.[1]

[1] A bibliographical listing of the mortgage experience studies, given in the order of Table 21, follows:

F. F. Hill, *An Analysis of the Loaning Operations of the Federal Land Bank of Springfield from Its Organization in March, 1917, to May 31, 1929*, Cornell University Agricultural Experiment Station, Bulletin 549, December 1932.

E. C. Johnson, *Farm Mortgage Foreclosures in Minnesota*, University of Minnesota Agricultural Experiment Station, Bulletin 293, 1932.

Stanley W. Warren, *Results of Farm-Mortgage Financing in Eleven Counties in New York State*, Cornell University Agricultural Experiment Station, Bulletin 726, December 1939.

Charles H. Merchant, *Farm Credit in Aroostook County, Maine*, University of Maine Agricultural Experiment Station, Bulletin 418, April 1943.

E. H. Mereness, *Farm Mortgage Loan Experience in Southeast Alabama*, Alabama Polytechnic Institute Agricultural Experiment Station, Bulletin 242, January 1935.

Joseph Ackerman and L. J. Norton, *Factors Affecting Success of Farm Loans*,

TABLE 21

Nine Mortgage Experience Studies and Their Coverage

Author	*Location*	*Lender*	*Number of loans*	*Period loans were made*
Hill	Springfield land bank district[a]	Federal land bank of Springfield	20,186	1917-29
Johnson	Minnesota	Federal land bank of Saint Paul	12,548	1917-30
Warren	Western & southern New York	Federal land bank of Springfield	2,267	1917-29
Merchant	Aroostook county, Maine	Federal land bank of Springfield	2,399	1917-37
Mereness	Southeastern Alabama	Several institutional lenders	4,750	1917-31
Ackerman & Norton	East central Illinois	Several institutional lenders	827	1917-33
Eckert & Maughan	Central Montana	Several institutional lenders	529	1911-32
Nelson	North central Iowa	Federal land bank of Omaha	627[b]	1917-32[b]
Hanson	Western Washington	Federal land bank of Spokane	7,801[b]	1917-32[b]

Bibliographical information is given in text footnote 1.

[a] Includes New England, New York, and New Jersey.

[b] Both Nelson and Hanson made supporting studies of additional loans made in later periods

Although the geographical coverage of the group of studies is far from complete, it is well diversified, including a wide variety of farming areas, from specialized potato production in Aroostook county, Maine, to mixed farming in western Washington and peanut and general farming in southeastern Alabama. The lender coverage is far less satisfactory. Six of the

University of Illinois Agricultural Experiment Station, Bulletin 468, August 1940.

Phil S. Eckert and Orlo H. Maughan, *Farm Mortgage Loan Experience in Central Montana*, Montana State College Agricultural Experiment Station, Bulletin 372, June 1939.

A. G. Nelson, *Experience of the Federal Land Bank with Loans in Four North Central Iowa Counties, 1917-47*, unpublished Ph.D. thesis, Iowa State College, 1949.

Kermit O. Hanson, *Federal Land Bank Loan Operations in Western Washington, 1917-49*, unpublished Ph.D. thesis, Iowa State College, 1950.

studies concern federal land bank loans exclusively. The remaining three include loans made by a variety of institutional lenders in addition to the federal land banks. Thus the studies are distinctly weighted on the side of land bank experience.

In procedural details the studies show considerable variety. Different investigators have analyzed different factors, depending on the information available to them, and have experimented with minor variations in statistical techniques. But basically all have used the same general approach of classifying loans into a number of categories and of comparing variations in loan experience among categories. In the same way, the conclusions of the studies show considerable variation in details and remarkable uniformity in fundamentals. Two important conclusions have been brought out repeatedly: that farms on the better land tend to have fewer foreclosures and lower losses,[2] and that farms with relatively small mortgages in terms of appraised value also have fewer foreclosures and lower losses. A third conclusion has been brought out with somewhat less certainty: that farms of large acreage have somewhat worse experience than small farms, but that the difference is usually associated with some other factor, such as grade of land or type of farming.

Quality of Land

Every one of the mortgage experience studies under review attempted to relate mortgage experience to soil productivity in one way or another. Although the criteria of productivity were many and varied, the results were surprisingly uniform. By almost any standard of measurement, loans made on the highly productive soils had relatively fewer foreclosures and lower losses than farms on the less productive soils.

The variety of measures used to ascertain productivity was due partly to limitations of data and partly to lack of agreement on the precise meaning of soil productivity. When F. F. Hill, one of the pioneers in making experience studies, analyzed the loans of the Federal Land Bank of Springfield in 1929, he

[2] The terms good land, poor land, better land, productive land, etc., commonly used by farmers and lenders and in loan experience studies, are obviously qualitative and relative. They are ordinarily used in a context which assumes existing land use and technology. In other words, "good land" is land on which returns are greater than on "poor land" under existing systems of land use and existing technology. Differences in this sense usually trace to differences in physical characteristics—soils, for example.

was unable to obtain data concerning soils on the farms covered. As a substitute, he used appraised value per acre and appraised value per acre of tillage land.

Since the time of Hill's study, institutional lenders have made increasing use of soil maps and productivity data, and systems of classifying land according to productivity and income-earning capacity have been advanced and improved. These developments have enabled later investigators to relate mortgage experience directly to soils or soil productivity. In 1935 Mereness classified a sample of Alabama loans according to fifteen specific soil types. He had no quantitative productivity ratings for the soils, but he was able to divide them into two broad groups—sandy loam types and other types—of which the sandy loams were more productive than the others. Mortgage experience was superior for the sandy loam types. In 1940 Ackerman and Norton, analyzing mortgage experience for 827 Illinois loans, divided specific soil types into three broad groups according to productivity ratings established by the Department of Agronomy of the University of Illinois. They, too, found that the best mortgage experience occurred on the land with the best productivity ratings.

More recently investigators have been using systems of economic land classification, of which there are now several. These systems have the common purpose of classifying and mapping land according to its economic value, or capacity to earn a return under existing systems of land use and technology. Differences occur, of course, in the methods of estimation as well as in the basic concept of the type of return to be estimated. Differences of definition are well illustrated by Kermit Hanson in a study of mortgage experience in western Washington, where two systems of land classification were in use: the "net income area" system used by the Federal Land Bank of Spokane and the "economic land use" system used by the State College of Washington and the State Department of Conservation and Development. An important difference between the two was the recognition of off-farm employment opportunities in the land bank system but not in the other. As a result there were cases where the same farming section was classified in a relatively poor land use class, say four, and a relatively good net income area, say two. This implied that a full-time farmer in such a section could probably earn no more than a very poor

living, whereas a part-time farmer could earn a good living by taking advantage of off-farm employment.

Hanson could obtain no direct evidence concerning the mortgage experience of part-time versus full-time farms, since the necessary records were not available for loans originated before 1945. Indirect evidence, however, suggested that the part-time farms had the better experience. For example, the foreclosure records for loans that were originated before 1932 indicated that farms with small acreage had better experience than large farms, and the records after 1945 indicated that the smaller farms included proportionately more part-time farms than full-time farms.

Debt Load

The relation of debt to total assets, more specificially the loan-to-value ratio, has long been regarded as one important indicator of the soundness of almost any loan transaction, whether a bank loan to business, a home mortgage loan, a corporate bond issue, or a farm mortgage loan. The farm mortgage lender usually attempts to maintain a minimum quality of loan by limiting all loans to a certain maximum ratio of loan to appraised value (often specified by law), and he may attempt to attain additional quality by making a substantial proportion of loans at less than the specified ratio, or by requiring amortization of principal.

An abundance of statistical information confirms the importance of the loan-to-value ratio. Both foreclosure rates and loss rates tend to be high when the debt burden is high. This tendency was found in all seven of the studies that covered the subject.

When loans are cross-classified by loan-to-value ratio and soil type (or land class), as was done in three of the studies, it becomes apparent that the safe debt load varies considerably with productivity of land. In southern Alabama, for example, the sandy loam soils are the most productive. Sampled loans ranging from 51 to 70 percent of the appraised value of farms on sandy loam soils had 10 percent foreclosures and losses of only $17 per thousand dollars loaned. That experience compares favorably with the experience on loans of only 21 to 30 percent of appraised value on other types of soil, which had 11 percent foreclosures and losses of $21 per thousand. Even farms having

100 percent loans on the sandy loam soils did better than farms having 41 to 50 percent loans on the other soils.

Size of Farm

The mortgage experience studies yield diverse results concerning size of farm, which is usually measured in number of acres. Most of them have indicated that the larger farms tend to have worse mortgage experience than the smaller ones, but one study, covering central Montana, found just the opposite.

Theoretical considerations seem to favor better mortgage experience for the larger units. Farm income and management studies have shown that fairly large farms—say those requiring about three men to operate—tend to be more efficient than the smaller units. Other things being equal, therefore, the larger farms should be able to earn a better return and carry a larger debt load than the smaller farms. But other things rarely are equal, and the farm mortgage studies show conclusively that size of farm is related to other important factors such as soil quality or type of farming. In southeastern Alabama, for example, the large farms tended to be located on the poorer soils. In western Washington the large farms were usually full-time enterprises, whereas the small farms tended to be part-time enterprises whose operator enjoyed a source of off-farm income that enabled him to meet mortgage payments more easily than his full-time competitors.

Other Factors

Mortgage experience studies have examined a long list of additional factors, including altitude, topography, age of borrower, amount of loan per acre, type of farming, number of cows kept, and many others. These are discussed in detail in Appendix A. In general they are of two types: those that gave little evidence of having an important bearing on loan experience, such as number of cows and age of borrower; and those that seem to be closely related to quality of land. Topography, for example, would be taken into account in almost any system of economic land classification, for it is an important determinant of erosion hazards and of usability of farm machinery. Also, altitude in many areas is correlated with both topography and soil type.

Appraisal of the Findings

From the foregoing brief résumé, it is evident that mortgage experience studies have made an appreciable contribution by

highlighting the importance of land quality and debt load as determinants of loan experience. Indeed their full contribution seems to go considerably deeper. The later studies have shown that farm land can be classified and mapped according to estimated earning power, and that the resulting areas, whether "land classes" or "net income areas," can be used effectively in classifying loan risks. Moreover, the later studies indicate that debt carrying capacity varies from one land class to another in a fashion that is not proportional to appraised value as usually determined. Farms in the better land classes appear capable of carrying much higher debts in proportion to appraised value than farms in the lower land classes.

The import of this last finding is that lending standards can be adjusted to make some allowance for variations in the quality of land. If such differential adjustments can be made reasonably effective, they may produce two important results: first, a tendency toward equalizing foreclosure and loss rates in the future among the different land classes; second, a tendency toward accentuating differences in land values. Once the limited debt carrying capacity of the poorer land classes is recognized, lenders should be more cautious and farmers less eager to borrow or even to make equity investments. Here it is pertinent to recall the argument of Part I that the geographical variations in mortgage experience were not so much due to productive limitations in areas of poor experience as to the fact that the productive limitations were not clearly recognized.

For example, the productive limitations of many parts of the northern Great Plains and the cut-over region of the Lake states were not recognized during the period of settlement.[3] Similarly, in Iowa during the World War I boom both borrowers and lenders apparently failed to give sufficient recognition to local differences in corn yields.[4] On the other hand, differences in productivity and debt carrying capacity appear to have been taken fully into account in making loans in central and western Kansas at that time, with the result that mortgage experience during the interwar period was on the whole at least as good in counties with low wheat yields as in counties with high wheat yields.[5]

While making important contributions, the mortgage experience studies have left unanswered a long list of questions. In

[3] See pages 61-68 and 122 f.

[4] See pages 87 ff.

[5] See pages 72 ff.

particular they have not produced any pertinent conclusions concerning the personal characteristics of borrowers or their farm management practices.

Lenders in general pay a good deal of attention to the personal integrity and business acumen of the borrower. Farm mortgage lenders usually want to know whether a prospective borrower is hard-working, honest, competent, and stable in his family relations. But although personal appraisal is considered extremely important, it is necessarily subjective. The loan appraiser typically states his general impression of the farmer, but he cannot give figures measuring the man's honesty or his ability to run a farm. Hence the statistician who investigates mortgage experience is limited to such personal characteristics as can be measured easily, and those may not be particularly pertinent. A few of the mortgage studies investigated the age of borrowers, for example; the results did not demonstrate that age has any appreciable relation to mortgage experience. Others studied the length and location of the borrower's previous farming experience and related those factors to foreclosures. The results were sometimes suggestive, but hardly conclusive. For example, Hill's study of land bank loans in New England, New York, and New Jersey indicated that borrowers from other parts of the United States without previous farming experience in the Northeast had rather poor mortgage records; but the difficulties appeared traceable more to mistakes in selecting farms than to actual farming operations.

Although farm management practices have been largely omitted in the study of mortgage experience, they have been covered extensively in studies of farm income, which analyze in detail the factors affecting farm profitability, including soil conditions and size of business as well as management practices. Such studies are not directly concerned with mortgage experience, but they are concerned with mortgage paying ability as reflected by farm earning power. Hence they can be used very effectively to complement studies of mortgage experience. Several income studies will be discussed in Chapter 7.

A RESUME OF SOME FARM INCOME STUDIES

THE relationship between farm income and mortgage experience was not covered directly in the experience studies just reviewed, largely because satisfactory income data were not available. In business lending, the borrower usually submits an income statement covering his operations over the preceding several years, but in farm lending the practice is not common. Often the borrower is buying the farm on which he applies for a loan; hence he has no statement. Even if an applicant has been farming his own land for some time, he may not have kept adequate financial records. Furthermore, many lenders are of the opinion that actual income statements are not particularly helpful in making long-term mortgage loans, since the original mortgagor may die or sell his farm to someone else who assumes the mortgage and who may be either more or less efficient than the first. For those reasons information concerning actual incomes on farms on which mortgage loans have been made is seldom available.

As a result of the farm mortgage distress that followed World War I, however, lenders began to place emphasis on potential earning power as a source of financial security and to rely somewhat less on the sale value of collateral assets. But instead of seeking conventional statements of past income, most institutional lenders preferred to make estimates of probable future farm income under so-called typical operation. Such estimates, which are ordinarily made at the time farms are appraised for loans, may serve either as aids in valuation or to ascertain whether earnings are likely to be sufficient to cover interest and amortization.

It was not until the late twenties that many institutional lenders began making estimates of typical earning power on a careful, systematic basis. Consequently the information was not particularly helpful to students of mortgage experience analyzing loans made in earlier periods. Most of the studies reviewed in Chapter 6 included loans made before 1920, and one of them, the Montana study, went back as far as 1911.

Although it has been impossible for the most part to compare directly the mortgage experience of individual farms during the

interwar period either with actual income records or with estimates of typical earning power, the experience studies reviewed in Chapter 6 brought out many relationships between mortgage experience and factors that imply differences in farm income. In the earlier studies, differences in income were implied by such criteria as appraised values per acre and differences in soils. In the later studies income differences were even more clearly implied in the analyses of loan experience by land class, net income area, or other categories in which land is classified according to its physical productivity and its ability to produce a financial return.

This chapter will review three studies that have dealt directly with variations in farm income from one grade of land to another and have related it to debt carrying capacity, though not paying much attention to foreclosure experience: the first, concentrating on farms in Frederick county, Maryland; the second, on the Newfane fruit section south of Lake Ontario in Niagara county, New York; and the third, on wheat yields and land values in northern Idaho. A fourth study, by the Bureau of Agricultural Economics, is concerned with variations among types of farming rather than grades of land, and is of interest because its coverage of certain of the farm types in many different areas gives it a possible bearing on the economic geography of farm mortgage distress.

Frederick County, Maryland

O. H. White analyzed the records of 205 Frederick county farms for 1938 and made estimates of average net cash income for farms in land classes II, III, IV, and V.[1] He then adjusted the income averages for family living expenses to obtain estimates of the amount of income, by land class, available for mortgage payments. Finally, he was able to estimate the maximum long-term loans that could be carried with the average available

[1] O. H. White, *The Productivity of Land in Relation to Farming Returns, Farm Capital, and Loan-Paying Capacity, Frederick County, Maryland, 1938* (Farm Credit Administration, mimeo., March 1941).

Land where some farming is being done but on which most of the farms are poor comprises land class II. If accessible and well located with respect to nonfarm job opportunities, it may be used for rural residential purposes. Otherwise it is better suited to forest and recreational uses than to permanent agriculture.

Land classes III, IV, and V comprise areas that probably will remain permanently in agriculture. The highest number indicates the best opportunity for farmers to earn incomes.

income for each land class, and to compare the hypothetical maximum loans with amounts that might have been granted under the then existing federal land bank standards. The highlights of White's findings are summarized in Table 22.

TABLE 22

Profitability and Debt Carrying Capacity of 205 Farms in Frederick County, Maryland, in 1938, by Land Class

	Land Class			
	II	III	IV	V
Average net cash income[a]	$217	$779	$1,585	$3,450
Cash living costs	413	694	973	1,398
Net cash income above living costs	−196	85	612	2,052
Implied maximum loan at 4 percent interest and amortization in 34½ years	0	1,574	11,333	38,000
Average value of farm real estate[b]	2,629	7,467	12,192	20,724
Land	1,336	3,822	5,853	9,716
Buildings	1,293	3,645	6,339	11,008
Maximum federal land bank loan[c]	927	2,640	4,194	7,060
Annual payment at 4 percent interest and amortization in 34½ years	50	142	226	381
Rate of return: net cash income to total capital	6%	8%	10%	13%

From *The Productivity of Land in Relation to Farming Returns, Farm Capital, and Loan-Paying Capacity, Frederick County, Maryland, 1938*, by O. H. White (Farm Credit Administration, mimeo., March 1941), Tables 9, 39, and 40, pages 13 and 42 f.

[a] Total cash receipts less cash expenditures. See Table B-1, page 223.

[b] Farmers' estimates.

[c] The maximum loan is computed as 50 percent of the average land value plus 20 percent of the average value of farm buildings, without regard to the legal limitations on loan units of less than $100.

In land class II, the poorest represented in the study, the 36 sampled farms had an average net cash income of $217 in 1938, which was inadequate to cover estimated living expenses of $413. Hence there would be no income available to meet mortgage payments in land class II—at least not from farm operations. In contrast, the 34 farms in land class V had an average net cash income of $3,450, which was sufficient to cover estimated living costs of $1,398 and leave a comfortable margin of

$2,052. What maximum loan could have been carried on that margin? In the 1930's the maximum contract length for amortized land bank loans was 34½ years, and the lowest rate of interest was 4 percent. A loan with such terms could be retired in equal annual payments of $54 per $1,000 of principal. At that rate, the $2,052 margin would have supported a principal amount of $38,000.[2]

A comparison of estimated debt carrying capacity with maximum allowable land bank loans was undertaken. At the time of White's study, land bank loans were limited to 50 percent of the appraised value of the farm land plus 20 percent of the value of the buildings. Separate valuations for land and buildings of the Frederick county farms were therefore needed, and were obtained through farmers' estimates. In land class V, farmers valued their land at $9,716, on the average, and the buildings at $11,008 (Table 22). Those amounts would have justified a land bank loan of $7,060 at the most, which is less than 20 percent of the maximum loan of $38,000 indicated by the income analysis. A somewhat similar situation existed in land class IV; the maximum loan by land bank standards was less than 40 percent of the maximum loan on an income basis. In land classes II and III, however, the maximum allowable land bank loan was substantially larger than the maximum loan as judged by income from farming. Thus, in terms of earning power and capacity to pay, the land bank lending standards appear to have been overgenerous in the lower land classes and conservative in the better land classes.

An important consideration, however, tends to mitigate the implied overlending of the land bank in the lower land classes. Loans in these land classes, and the interest and amortization payments on them, would be small. The $927 estimated maximum land bank loan for land class II, for example, could be retired at the rate of $50 a year (for a 34½ year loan at 4 percent interest)—an amount that could be covered fairly easily through off-farm work.

One other comparison is noteworthy, namely the variation in rates of return among land classes. Net cash income when expressed as a percent of total farm capital varied from 6 percent in land class II to 13 percent in land class V (Table 22). The variation is even more spectacular when net cash income is adjusted for the value of operator and family labor—a very

[2] Further reference to White's estimates of debt carrying capacity is made in the section on earnings coverage, page 172.

common adjustment for calculating rates of return in farming. In land class II the labor charge was valued at more than the net cash income; hence the rate of return for the lowest land class was negative, —1.7 percent.[3] In land class V the rate of return was 11.4 percent, even after the adjustment for labor.

Soils and Incomes in the Newfane Area

Since 1913 the Department of Agricultural Economics at Cornell University has been obtaining business records for a number of farms in Newfane township, Niagara county, New York.[4] Although the attempt was made to cover identical farms from year to year, some variation was inevitable, partly because farms may be broken up or combined, partly because individual farm owners may cooperate in providing information in some years but not in others.

The Newfane area is located in the western New York fruit belt, which extends along the south shore of Lake Ontario. Apples and peaches are the two chief crops, along with a wide variety of other products such as cherries, plums, cabbages, tomatoes, wheat, and beans. Climatic conditions in Newfane are moderated by the proximity of Lake Ontario and are well suited to orchards. Soil conditions are quite variable; the better soils are well suited to fruit, but the poorer soils are not.

A considerable amount of farm financial distress in Newfane has arisen from the variability of its soils, often not readily apparent. Good orchard land requires a deep topsoil and a porous subsoil to provide good drainage. Neither condition is evident from superficial inspection, but must be established by boring into the soil, perhaps to a depth of six feet. Before the importance of subsoil analysis was fully understood, many Newfane orchards were planted on land with inadequate drainage. This, of course, was a serious mistake, for the planting of an orchard involves a heavy capital outlay that must be amortized over a long period. Moreover, some time elapsed before such mistakes were recognized, because the full effects of poor drainage

[3] White, *op.cit.*, Table 25, p. 24.

[4] Collection of data in the Newfane area has been under the direction of Professor G. P. Scoville. In making our analysis we have had recourse to two papers by Herrell F. DeGraff: *An Economic Study of Farming in the Town of Newfane, Niagara County, New York* (unpublished Ph.D. thesis, Cornell University, 1941), and *The Ownership and Mortgage History of Farms in the Town of Newfane, Niagara County, New York* (New York State College of Agriculture, Cornell University, No. A.E. 341, mimeo., March 1941).

develop only in older orchards. After about twenty years, yields decline and trees begin to die.

The gradual adjustment of Newfane agriculture to soil variations had a pronounced effect on land use in the area. Farmers on the better grade of land found that they were able to specialize in intensive fruit culture, with emphasis on a quality product. Those on poorer land, however, were forced into more diversified and more extensive agriculture. Some of the statistical highlights of this shift are contained in Table 23,

TABLE 23

Variations in Intensiveness of Farming in Newfane, New York, 1913-39, by Soil Group

	Soil Group[a]						
	1	2	3	4	5	6	Average
1913-19							
Share of all receipts due to fruit	84%	75%	73%	54%	50%	44%	64%
Total receipts per acre[b]	$61	$62	$52	$40	$38	$36	$46
Total expenditures per acre[c]	40	37	31	24	22	22	28
Farm income per acre	21	25	21	16	16	14	18
1920-29							
Share of all receipts due to fruit	79%	71%	69%	53%	51%	45%	62%
Total receipts per acre[b]	$91	$71	$61	$49	$41	$38	$54
Total expenditures per acre[c]	68	48	43	34	31	27	39
Farm income per acre	23	23	18	15	10	11	15
1930-39							
Share of all receipts due to fruit	85%	65%	62%	45%	38%	32%	60%
Total receipts per acre[b]	$84	$58	$42	$30	$29	$24	$42
Total expenditures per acre[c]	61	42	32	24	24	20	32
Farm income per acre	23	16	10	6	5	4	10

From Herrell F. DeGraff's *An Economic Study of Farming in the Town of Newfane, Niagara County, New York* (Cornell University, unpublished Ph.D. thesis, 1941), Tables 23 and 26, pages 68 and 72. The data cover 354 farms.

[a] Farms grouped by adaptability of soil to fruit growing, from best (group 1) to poorest (group 6); see text footnote 5.

[b] Includes increases in the value of inventory as well as purely cash receipts.

[c] Includes unpaid family labor and decreases in the value of inventory as well as cash expenditures. See Tables B-1 and B-2, Appendix B.

which covers six soil groups (that is, groups of farms classified according to the suitability of their soils for fruit growing) and three periods, 1913-19, 1920-29, and 1930-39. The soil groups are arranged in order from farms on land best adapted to fruit, group 1, to those on land least adapted, group 6.[5]

[5] The following quotation from DeGraff's thesis, *An Economic Study of Farming in . . . Newfane*, page 58, explains the method of classification:

"With the assistance of Mr. C. S. Pearson of the Department of Agronomy at the New York State College of Agriculture, the important soils of the Newfane area have been separated into three groups on the basis of depth and rapidity of internal drainage, as follows:

Adaptability of Soils of the Newfane-Olcott Area for Fruit Growing

Soils well adapted to fruit	*Soils less well adapted to fruit*	*Soils poorly adapted to fruit*
Alton gr. f.s. lm.	Barker gr. lm.	Allendale f.s. lm.
Alton f.s. lm.	Barker f.s. lm.	Barker gr. lm. imperfectly drained phase
Alton gr. lm.	Barker gr. f.s. lm.	Colwood si. lm.
Alton coarse s. lm.	Berrien f.s. lm.	Eel si. lm.
Appleton f.s. lm.	Berrien lm. f.s.	Farmington si. lm.
Arkport f.s. lm.	Clarkson gr. lm.	Fulton si. cl. lm.
Dunkirk lm.	Clarkson gr. s. lm.	Granby f.s. lm.
Dunkirk f.s. lm.	Collamer si. lm.	Hilton gr. lm.
Dunkirk si. lm.	Collamer si. cl. lm.	Hilton gr. lm., heavy subsoil phase
Dunkirk si. cl. lm.	Hamlin si. lm.	Hilton gr. f.s. lm.
	Lockport si. cl. lm., well drained phase	Hilton gr. si. lm.
	Ontario si. lm.	Hilton gr. si. lm., heavy subsoil phase
		Hilton si. lm.
		Hilton si. lm., heavy subsoil phase
		Lockport si. cl. lm.
		Lockport si. cl. lm., imperfectly drained
		Maumee lm. f.s. phase
		Toledo si. cl. lm.
		Wauseon f.s. lm.
		Wayland si. lm.
		Wolcottsburg si. lm.

Legend:

Alton gr. f.s. lm.	=	Alton gravelly fine sandy loam
Dunkirk si. cl. lm.	=	Dunkirk silty clay loam
Berrien lm. f.s., etc.	=	Berrien loamy fine sand

"The soils listed as being well adapted to fruit are the deepest and best drained. Those given as poorly adapted are either shallow or imperfectly drained or both. The others are intermediate. Within the groups there are, of course, some differences, but they are thought to be less than the differences between the groups.

"For each of the Newfane farms on which records have been obtained, the acreage of each important soil type on the farm was determined. This was done by using a map bearing both soil lines and farm lines and planimetering the area of each soil within the farm boundaries. (This work was done by the Farm Credit Administration under the direction of Dr. A. B. Lewis . . . in connection with a study of the relation of income to capital.) Using these data the per cent of good, medium and poor fruit soils as classified above was de-

Even in the early period, 1913-19, farmers in the better soil groups derived a much higher share of their total receipts from fruit than farmers in the poorer groups. The group 1 farmers, for example, derived 84 percent of their receipts from fruit; the group 6 farmers derived only 44 percent. In the latest period, 1930-39, the differences between soil groups had become considerably more pronounced. The share derived from fruit receipts had increased ever so slightly from 84 percent to 85 percent for group 1; it had decreased for all other groups.

In 1913-19 there was some variation in total receipts per acre, ranging from $62 (for group 2) to $36 (for group 6). The range of variation increased in the later periods. By 1930-39 receipts per acre had increased substantially for group 1, from $61 to $84, whereas decreases had occurred for all other groups. Expenses per acre had also increased substantially for group 1, but less than receipts. In the other groups, expenses had changed hardly at all—sometimes increasing by a few dollars, sometimes decreasing. A detailed analysis of expenditures reveals that the increase for group 1 was due mainly to greater use of spray and higher outlays for packaging, changes made for the purpose of producing and marketing a high grade, specialty product.[6]

The net effect of these changes in receipts and expenditures on farm income was substantial. In 1913-19 the variations in farm income per acre were not marked, ranging only from $25 to $14, group 2 having the highest. By 1930-39, however, farm income per acre had increased slightly for group 1 and had decreased for all others. The range then extended from $23 for the best soil group to $4 for the poorest. Average farm income per farm and average rate of return, derived by expressing farm income as a percentage of total farm capital, are shown in

termined for each farm. The farms were then divided into six groups for analysis on the basis of the percentage of good, medium, and poor fruit soil on the individual farms. Those placed in soil group 1 were considered to be best suited to fruit. They averaged nearly 80 per cent good fruit soil and less than 10 per cent poor. Group 6 includes the farms least adapted to fruit. They averaged over 90 per cent poor fruit soils. Twenty-eight per cent of the 354 farms that have been included in the surveys fell in group 6, and 9 per cent in group 1. The other groups were intermediate in number of farms as well as in soil quality.

"Classifying the farms of the Newfane-Olcott area on the basis of soil differences is essentially the same as a 'land classification' sort, since this is the only criterion used in establishing land class areas that varies to any appreciable degree over the township."

[6] Herrell F. DeGraff, *An Economic Study of Farming in . . . Newfane*, Table 42, p. 98.

Table 24. During the 1913-19 period farm income followed a more or less regular downward progression from group 1 to group 6, but rates of return varied little among groups. In the following decade returns tended to be a little lower, farm income averaging $1,018 as against $1,244 in the earlier period. Again, however, there was little variation among soil groups as to rate of return. But in the depression decade, 1930-39, substantial differences among soil groups developed. Although the average income for all groups declined from $1,018 to $747, the average for group 1 actually increased. Partly because of the increased income, but mainly because of substantially lower valuations placed by farmers on their farms in 1930-39, the rate of return for group 1 was raised to 10.5 percent, which was nearly twice as high as the rate for all groups combined, and almost exactly three times as high as the rate for group 6.

The financial superiority of the higher-grade land is further indicated by the ownership and mortgage history of 71 New-

TABLE 24

Farm Income per Farm and Rate of Return for Newfane Farms, 1913-39, by Soil Group

	Soil Group[a]						
	1	2	3	4	5	6	Average
1913-19							
Farm income[b]	$2,058	$1,680	$1,615	$1,070	$1,028	$778	$1,244
Rate of return[c]	6.7%	9.1%	7.8%	8.0%	8.3%	7.5%	7.7%
1920-29							
Farm income[b]	$1,844	$1,502	$1,414	$1,074	$666	$605	$1,018
Rate of return[c]	6.0%	6.8%	6.0%	6.5%	5.0%	5.2%	5.8%
1930-39							
Farm income[b]	$2,162	$1,153	$812	$480	$406	$273	$747
Rate of return[c]	10.5%	7.4%	5.7%	4.8%	4.3%	3.6%	6.2%

Based on data in *An Economic Study of Farming in the Town of Newfane, Niagara County, New York*, by Herrell F. DeGraff (Cornell University, unpublished Ph.D. thesis, 1941). The data cover 354 farms.

[a] Farms grouped by adaptability of soil to fruit growing, from best (group 1) to poorest (group 6); see text footnote 5.

[b] Farm income as defined in Table B-2, Appendix B.

[c] Ratio of average farm income to average farm capital.

fane farms.[7] The sample includes 60 of the farms covered by the previous income analysis, and 11 other farms for which records were available. The records utilized, which were copied from the Niagara county clerk's office, cover mortgages, transfers, and sometimes price considerations from the date of settlement (around 1835) to 1939. For the mortgage analysis, farms were classified by economic land class, as defined in New York, rather than by soil group, since soils data were unavailable for the eleven farms not included in the income study. In the classification by economic land class, higher numbers indicate better land. Of the 71 farms, 31 fell in classes III and IV, and 40 fell in classes V and VI.[8] Some interesting differences between the two groups are apparent.

The farms in land classes III and IV—that is, on the less productive land—changed hands oftener and were less likely to be transferred through inheritance or other family transactions.[9] The median average length of holding for these farms was five years, which means that half of the owners had possession five years or less; the median for farms in land classes V and VI was ten years. On the good farms 25.5 percent of the owners obtained ownership through inheritance or family connection, which compares with 14 percent for the poor farms.

The owners of the good farms had recourse to mortgage credit less often, and if they did mortgage their farms, they were more likely to get out of debt subsequently. These tendencies are brought out in Table 25, which presents a condensed mortgage history of the 591 owners of the 71 farms studied.

The history of Newfane mortgages, as distinct from farms mortgaged, tells much the same story; mortgages on the good farms were more likely to be paid off, even though they were roughly twice as large. Between the date of settlement and 1939, 529 mortgages were placed on the 71 farms. Often mortgages

[7] Herrell F. DeGraff, *The Ownership and Mortgage History of Farms in the Town of Newfane, Niagara Country, New York* (New York State College of Agriculture, Cornell University, No. A.E. 341, mimeo., March 1941).

[8] In the township of Newfane, soil is the only factor used in economic land classification that varies to any appreciable extent, so that land class and soil groupings for the area are closely correlated. For 60 of the 71 farms in the mortgage study both soil group and land class were known. Eighty percent of the farms in Newfane in land classes V and VI for which soils data were available were in soil groups 1, 2, and 3. These are the groups having the better fruit soils. Only 13 percent of the farms in land classes III and IV were in soil groups 1, 2, and 3.

[9] DeGraff, *The Ownership and Mortgage History of Farms in . . . Newfane*, pp. 9 f.

TABLE 25

Mortgage History of 71 Newfane Farms

Mortgage history	*31 farms in land classes III and IV*		*40 farms in land classes V and VI*	
	Number of owners	Percent of total	Number of owners	Percent of total
Farm never mortgaged	65	20%	69	27%
Mortgaged at first, out of debt later	56	17	59	23
No debt at first, mortgaged later	20	6	18	7
Farm never clear	191	57	113	43
Total	332	100%	259	100%

From Herrell F. DeGraff's *The Ownership and Mortgage History of Farms in the Town of Newfane, Niagara County, New York* (New York State College of Agriculture, Cornell University, No. A.E. 341, mimeo., March 1941), Table 5, page 11. Based on records extending from about 1835 to 1939.

ran concurrently. There are several examples of farms subject to as many as five mortgages for a short space of years. Table 26 recounts the experience of all mortgages taken individually.

TABLE 26

Repayment Performance on 529 Newfane Mortgages

Method of disposal	*Distribution of Mortgages in land classes*				*Average size of mortgages in land classes*	
	III and IV		*V and VI*			
	Number	Percent of total	Number	Percent of total	*III and IV*	*V and VI*
Refinanced	86	30%	63	26%	$1,900	$4,311
Discharged at time of sale	40	14	38	16	2,079	3,382
Foreclosed or deeded back	44	15	24	10	1,840	5,015
Paid out of income[a]	118	41	116	48	1,351	2,366
Total	288	100%	241	100%	$1,676	$3,265

From Herrell F. DeGraff's *The Ownership and Mortgage History of Farms in the Town of Newfane, Niagara County, New York* (New York State College of Agriculture, Cornell University, No. A.E. 341, mimeo., March 1941), Table 10, page 21. Based on records extending from about 1835 to 1939.

[a] Mortgages not discharged by one of the first three methods were assumed to have been paid out of the mortgagor's income, which of course may or may not have been from farm earnings.

Wheat Yields and Land Values in Northern Idaho

Nybroten's study of yields and land values is significant because it indicates that typical rental incomes to the landlord sometimes differ greatly from typical incomes under owner operation.[10] In the area studied, which includes Latah, Lewis, and Nez Perce counties in the western panhandle of Idaho, most of the arable land is devoted to wheat, and much of it is farmed under share lease, with the landlord receiving one-third of the crop. This means that average rentals on different grades of land are proportional to average wheat yields; the rent on land averaging 40 bushels would be twice the rent on land averaging only 20 bushels. But net income to a landowner who farms his own land behaves in a very different fashion from rental income, because of fixed costs. For the period studied, Nybroten estimated that costs were roughly equivalent to 17.5 bushels of wheat per acre, regardless of the yield per acre. Therefore, land averaging 20 bushels would produce a net income to the owner-operator of only 2.5 bushels, compared with the typical rental of 6.7 bushels; but land averaging 40 bushels would produce a net of 22.5 bushels to the owner-operator, compared with the rental of only 13.3 bushels.

According to Nybroten, the discrepancy between rentals to the landlord and net income to the owner-operator had a pronounced effect on land values in the Idaho panhandle. Rental income was the dominating factor. In appraising farms for investment, a prospective landlord would be primarily concerned with expected rentals, which would be directly proportional to average wheat yields, and thus land averaging 40 bushels would be worth twice as much to him as land averaging 20 bushels. An owner-operator, on the other hand, would be concerned with the net income-producing capacity of the land. If Nybroten's costs and returns estimates are correct, land averaging 40 bushels gross and 22.5 bushels net is worth nine times as

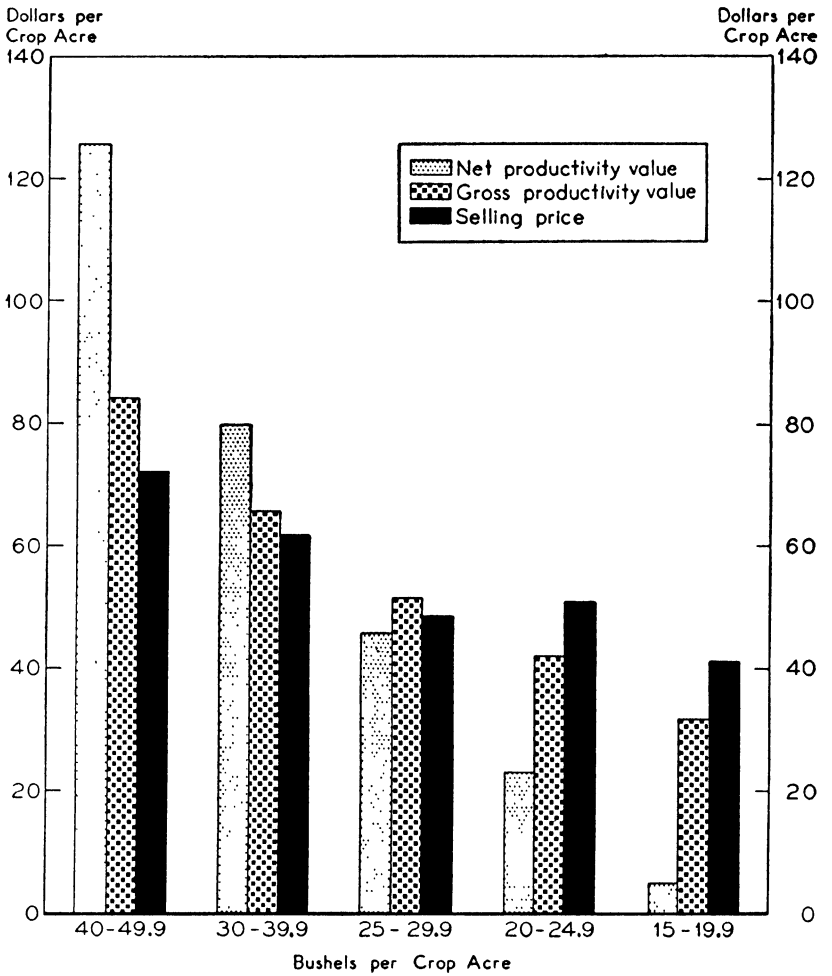
[10] The material reviewed in this section is from *Land Values, Mortgages, Rents, and Wheat Yields of Northern Idaho Wheat Lands*, by A. Norman Nybroten (University of Idaho Agricultural Experiment Station, Bulletin 248, April 1942), pages 13-18. The data on wheat yields "were obtained from a study made cooperatively by the Works Progress Administration and the Department of Agricultural Economics, Agricultural Experiment Station, University of Idaho. Reports of this study were published under the supervision of Paul A. Eke. Several students, some of them paid by the National Youth Administration, assisted in gathering and tabulating the data."

much to an owner-operator as land averaging 20 bushels gross and only 2.5 bushels net.

But in the three counties studied, the landlords seemed to dominate the market and set the price of land. Nybroten reached that conclusion after analyzing 450 farm transfers that occurred in 1936-40. The transferred farms comprised 57,560 crop acres and produced an annual average of 1,702,024 bushels of wheat, or 29.6 bushels per acre. After deduction for expenses, estimated at 17.5 bushels per acre regardless of yield, a total of 694,724 bushels, or 12.1 per acre, remained as net product. The farms sold for a total of $3,174,871, which amounted to $1.87 per bushel of gross product, and $4.57 per bushel of net product after allowance for expenses. The 450 transferred farms were separated into five classes according to average wheat yield, and a "gross productivity value" and a "net productivity value" were calculated for each class. The gross productivity value was determined by setting the gross wheat yield for each class at the midpoint of the range of yields and multiplying it by $1.87. Thus in the class of farms yielding 40 to 49.9 bushels per acre, the gross productivity value per acre was 45 times $1.87, or $84.15. The net productivity value was determined by taking the gross yield for each class, deducting the estimated expenses of 17.5 bushels per acre, and multiplying the remainder by $4.57. Thus in the 40 to 49.9 class, 45 bushels less 17.5 bushels leaves 27.5 bushels, which when multiplied by $4.57 gives a net productivity value of $125.68 per acre.

The two productivity values were then compared with actual selling prices and assessed values. The results (Figure 37) indicate: first, that selling price conforms very closely to gross productivity and hence rental value; second, that selling price does not conform well to net productivity; third, that the operator, whether tenant or owner, will enjoy a far higher return on investment if he farms high-grade land. This, of course, raises the question why the owner-operators, and those who wish to become owner-operators, do not bid up the price of the better land. According to Nybroten, "The reason that land values have not been in these proportions in the past is that the landlord has been able to set values on the basis of receiving a third of the crop. When the prospective land purchaser has estimated what land is worth to him as an operator, he has calculated the value of the share he would have to give a landlord if he were to rent rather than to buy. However, the value arrived at in

Figure 37. Net and Gross Productivity Value and Selling Price for 450 Idaho Farms Transferred in 1936-40, Classified by Average Yield



After a chart in the work of Nybroten cited in footnote 10. For discussion of the chart see accompanying text.

this manner overvalues the poorer land and undervalues the better land."[11]

A second question is raised, concerning the rationale of the rental system. Why do not tenants compete for the privilege of farming the best land by agreeing to pay more than the cus-

[11] *Op.cit.*, p. 17.

tomary one-third? They appear to be doing so to some extent. "There are indications of a growing trend toward breaking away from the customary one-third share rent on all grades of land. Particularly in Lewis County, higher shares are given to the landlord on better land and, in a few instances, less than one-third is given as rent on the poorer-than-average land. Cash rents are taking the lead in this—rising relatively more on the better land. . . . Should this tendency continue to grow, it will have serious effects on the relative values of different grades of land."[12]

Studies of Typical Farms by the Bureau of Agricultural Economics

The Bureau of Agricultural Economics is currently compiling detailed data on the operations of common types of commercial family-operated farms, covering a wide variety of farm technologies and geographical areas. Publications so far have dealt with twenty types, and research on seven more is in progress.[13] For eighteen of the types studied the data are available yearly since 1930, and readily permit calculations of average income, rates of return, and stability of income during roughly the second half of the interwar period. Although these BAE series tell us nothing about variations among individual farms, they tell us a good deal about variations among farming types, and

[12] *Ibid.*, pp. 17 f.

[13] Reports published to date are the following:

Wylie D. Goodsell, Ronald W. Jones, and Russell W. Bierman, *Typical Family-Operated Farms, 1930-45, Adjustments, Costs and Returns*, Bureau of Agricultural Economics, F.M. 55, April 1946.

Farm Costs and Returns, 1945-47, Commercial Family-Operated Farms in 6 Major Farming Regions, Bureau of Agricultural Economics, F.M. 70, September 1948.

H. R. Hochmuth and Wylie D. Goodsell, *Commercial Family-Operated Cattle Ranches, Intermountain Region, 1930-47, Organization, Costs, and Returns*, Bureau of Agricultural Economics, F.M. 71, November 1948.

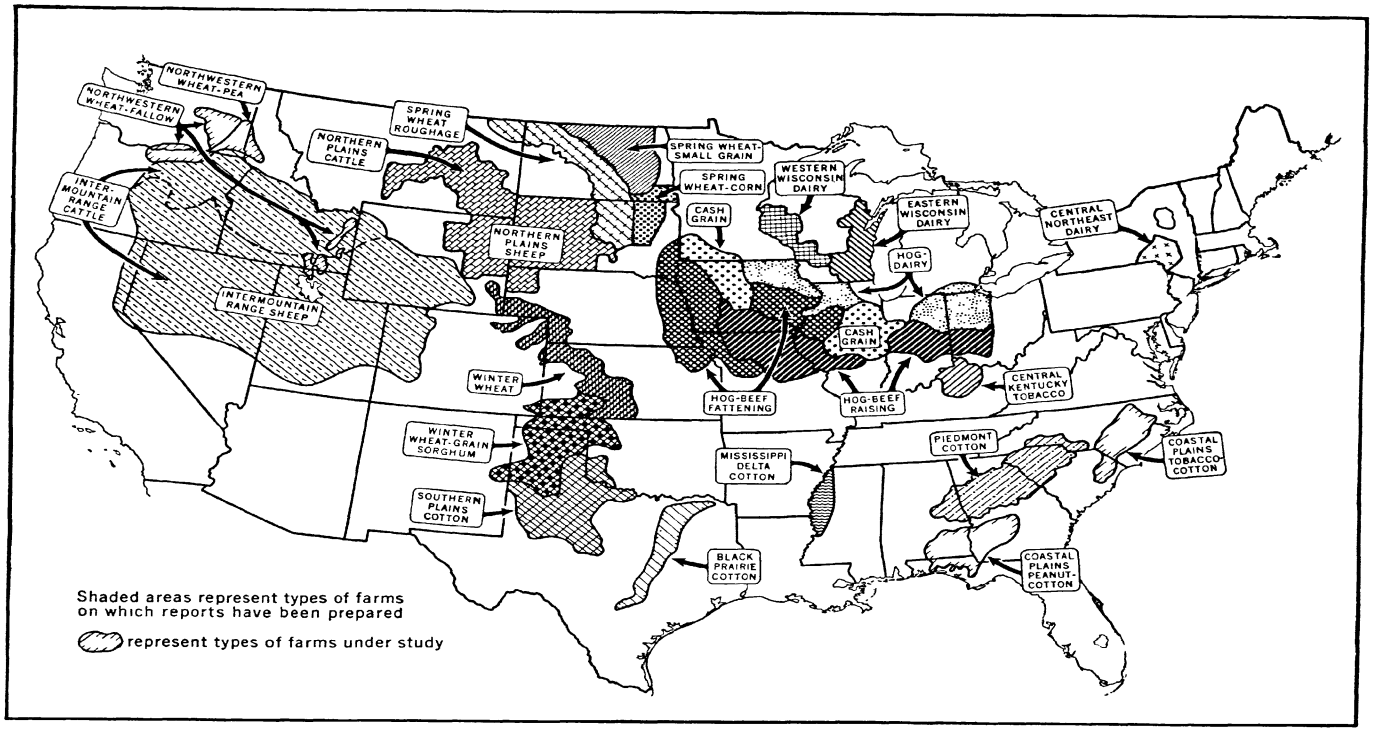
Erling Hole and John H. Bondurant, *Farming in the Bluegrass Area of Kentucky, Operations, Costs, and Returns, 1930-48*, University of Kentucky Agricultural Experiment Station, in cooperation with the Bureau of Agricultural Economics, Bulletin 544, December 1949.

Emil Rauchenstein, Walter W. Wilcox, and Edward J. Smith, *Changes in Dairy Farming in Wisconsin, 1930-48*, University of Wisconsin, Research Bulletin 166, February 1950.

Farm Costs and Returns, 1950 with Comparisons, 16 Commercial Family-Operated Farms in 8 Major Farming Regions, Bureau of Agricultural Economics, F.M. 82, May 1951.

W. Herbert Brown, *Cotton Farming in the Southern Piedmont, 1930-51*, Bureau of Agricultural Economics, Agr. Inf. Bul. 89, June 1952.

Figure 38. Location of Types of Family-operated Farms Studied by the Bureau of Agricultural Economics



Map supplied by U.S. Department of Agriculture, Bureau of Agricultural Economics.
The map locates the farms included in the studies drawn on for Table 27. It is not intended to delineate type-of-farming areas (cf. color map) or to show the type of farm predominant in an area.

they provide some opportunity to draw comparisons between the income experience of these types and the farm mortgage distress that developed in the areas where the farm types are located (Figure 38).

Certain problems arise in attempting to draw comparisons between BAE income data and mortgage experience in the indicated areas. Most serious, perhaps, is the fact that the BAE farming types, which were originally selected without such comparisons in mind, are not the only types commonly found in the indicated areas.[14] As an extreme example, in the delta cotton area in Mississippi large plantations predominate, and the family-sized farms covered by the BAE represent only about 15 percent of the total crop acreage.

Notwithstanding the difficulties of comparison, certain significant relations stand out in Table 27, which gives BAE information on the profitability of family-operated farms of eighteen types located in areas shown on Figure 38, and summarizes the mortgage experience of all farms in those areas according to the material of Chapter 1. Three measures of profitability are given for the eleven years 1930-40:[15] (1) net operating income, which is cash receipts less cash expenses plus change in inventory; (2) return to operator and family labor, which includes adjustments for farm perquisites and for capital invested; and (3) rate of return, which is here defined as the ratio of net operating income to the value of real estate, machinery, livestock, and crops on hand.[16] Since the measures are basically different, it is natural that some farm types should appear profitable in one respect and unprofitable in another. It is

[14] Throughout the discussion of the BAE material the following statement (Goodsell, Jones, and Bierman, *op.cit.*, page 4) should be kept in mind: ". . . This project is not designed to analyze and represent farm operations and incomes for entire *type-of-farming* areas. . . . [It] is designed rather to study, analyze, and represent farming operations on family-operated farms *by size and type.* Areas are selected for study where a particular type of farm is common even though other types of farms may often be found in the same area. . . . Figure 1, therefore [see Figure 38 of the present text], shows the location of types of farms . . . under study. It should not be interpreted as representing all types of farms in any area or as showing areas represented by types of farms studied."

[15] Though information for earlier years is lacking, the BAE data would permit extension into later years, say through 1945, which of course would result in a substantially different picture of farm incomes. But we have chosen the period 1930-40, covering the depression of the thirties, when so many foreclosures occurred, and also a few years of recovery during the defense period, as the best one for comparison with the various data on which our summary of mortgage experience is based.

[16] For a fuller definition of terms, see Appendix B, particularly Table B-3.

TABLE 27

Selected Asset and Income Items and Rate of Return for 18 Types of Farms, 1930-40, and Mortgage Experience in Areas Where They Were Common

Type of farm[a]	*Average net operating income*[b]	*Average net income earned by operator and family labor*[b]	*Average value of real estate, machinery, livestock, and crops on hand*	*Rate of return*[c]	*Mortgage experience in area*
Central New York					
Dairy	$736	$640	$9,088	8.1%	Good
Southern Wisconsin					
Dairy, eastern	752	450	12,069	6.2	Good
Dairy, western	559	416	8,753	6.4	Poor
Corn Belt					
Cash grain[d]	1,447	685	26,983	5.4	Fair—good
Hog-beef fattening	999	453	21,031	4.8	Fair—good
Hog-beef raising	510	398	10,780	4.7	Poor—good
Hog, dairy	836	616	12,686	6.6	Fair—good
Northern Plains					
Spring wheat, corn, livestock	438	354	12,590	3.5	Poor
Spring wheat, small grain, livestock	274	251	11,887	2.3	Poor
Spring wheat, roughage, livestock	173	229	10,707	1.6	Poor
Southern Plains					
Winter wheat	607	294	18,960	3.2	Poor
Winter wheat, grain sorghum	763	422	18,898	4.0	Poor—good
Cotton, grain sorghum	717	614	8,671	8.3	Good
Texas Black Prairie					
Cotton	740	661	9,305	8.0	Fair—good
Mississippi Delta					
Cotton	488	518	2,952	16.5	Poor—fair
Southern Piedmont					
Cotton	171	152	4,233	4.0	Poor
Central Kentucky					
Tobacco, livestock	597	433	7,383	8.1	Good
Intermountain Region					
Cattle ranches	1,476	561	25,644	5.8	Poor—fair

Data are from the following sources:

For cattle ranches, *Commercial Family-Operated Cattle Ranches, Intermountain Region, 1930-47, Organization, Costs, and Returns*, by H. R. Hochmuth and Wylie D. Goodsell (Bureau of Agricultural Economics, F.M. 71, November 1948), page 14.

For central Kentucky tobacco, *Farming in the Bluegrass Area of Kentucky, Operations, Costs, and Returns, 1930-48*, by Erling Hole and John H. Bondurant (University of Kentucky Agricultural Experiment Station, in cooperation with the Bureau of Agricultural Economics, Bulletin 544, December 1949), page 26.

For eastern and western Wisconsin dairy farms, *Changes in Dairy Farming in Wisconsin, 1930-1948*, by Emil Rauchenstein, Walter W. Wilcox, and Edward J. Smith (University of Wisconsin, Research Bulletin 166, February 1950), Tables 9 and 10, pages 32 f.

For southern piedmont cotton farms, *Cotton Farming in the Southern Piedmont, 1930-51*, by

W. Herbert Brown (Bureau of Agricultural Economics, Agr. Inf. Bul. No. 89, June 1952), Tables 28 and 29, pages 57 f.

For other types, *Typical Family-Operated Farms, 1930-45, Adjustments, Costs, and Returns*, by Wylie D. Goodsell, Ronald W. Jones, and Russell W. Bierman (Bureau of Agricultural Economics, F.M. 55, April 1946).

[a] See Figure 38 for location of farms studied.

[b] For explanation see Appendix B.

[c] Ratio of average net operating income to average value of real estate, machinery, livestock, and crops on hand.

[d] In addition to farms in the areas shown as "cash grain" on Figure 38, farms in a strip extending from southeastern South Dakota through eastern Nebraska into Kansas (lying just west of the westernmost hog-beef fattening farms shown) are included.

striking that four farm types stand out as conspicuously unprofitable on all counts during the eleven-year period—three that are common in the northern plains and the cotton farm type common in the southern piedmont. Mortgage experience was bad in the indicated areas. Possibly a fifth type should be added to the unprofitable category—the winter wheat type common in the southern plains. Again, mortgage experience in the indicated area was poor.

The two types of family-operated farms with the highest net operating income were the cattle ranches in the Intermountain region and the cash grain farms in the Corn Belt. The cash grain farms, moreover, also had the highest return to labor. But because both these types have high capital requirements, their rates of return were substantially less than those of some types having lower requirements—most notably the delta cotton farms in Mississippi. It is quite probable that despite the high capital requirements much higher returns for the cash grain farms would be shown if data for the western segment of farms could have been eliminated. The western part of the relevant area, which is not included on Figure 38, and which extends from southeastern South Dakota through Nebraska and into Kansas, suffered much more from the drought of the thirties than did the sections of Iowa and Illinois where the rest of the cash grain farms were located. Mortgage experience was relatively poor in the indicated western area; in the eastern areas it was relatively good.

Stability of income is also important. Even where earnings are high on the average over a long period, a few consecutive years of low income may prove disastrous. Unless the farmer saves enough during good years to tide him over a bad period, he will certainly have financial difficulties, and he may lose his farm. If the bad years occur early in the life of a mortgage, be-

fore there is opportunity to acquire a surplus, the chances of foreclosure are so much the greater.

An important development affecting loan experience of the thirties was the decline in farm incomes following World War I, a period not covered by BAE records for specific types of farms. Fluctuations during the thirties, however, give some indication of the relative income stability for family-operated farms of the different types (Table 28). One measure of stability is the range of annual incomes, and in connection with mortgage distress the lower end of the range is particularly significant. Ten of the eighteen types had deficits of net operating income in at least one year, and some had deficits in several years. Another measure of stability is the standard deviation of net operating income, which measures variation in absolute dollar amounts.[17] A third measure is the coefficient of variation, which measures relative variation.[18] The eighteen farm types in Table 28 are arranged in order of stability according to the coefficient of variation. At the upper end of the scale, the dairy farms in central New York and the cotton farms in the Texas Black Prairie were relatively stable by all three counts. Mortgage experience in central New York was good, and in the Texas Black Prairie strip was fair to good. At the other end of the scale, the three types in the northern plains that showed up as conspicuously unprofitable were also highly unstable on all counts. Mortgage experience in the northern plains was poor.

Implications of Farm Income Studies

In the first three studies reviewed, it was found that farm land values were not proportional to financial returns during the period covered. In each instance land that was poorly adapted to the type of farming carried on in the area under study was

[17] The standard deviation, also called the root mean square deviation, measures the amount by which individual years differ from the average of all years. The method of computation, apart from short cuts that affect the work but not the results, is as follows: Given N years, X_1, X_2, . . X_I, . . X_N, calculate the deviation of each year from the average, $D_I = X_I - X$. Square the deviations (the squares are always positive) and sum them, ΣD_I^2. Divide the sum by the number of years, $\Sigma D_I^2/N$, and extract the square root, $\sqrt{\Sigma D_I^2/N}$.

Usually, about two-thirds of all years will not differ from the average by more than one standard deviation in either direction.

[18] The coefficient of variation is determined by dividing the standard deviation by the average. It is often expressed as a percentage, as in Table 28. The coefficient of variation for New York dairy farms, 32 percent, means merely that the standard deviation is 32 percent of the average. The coefficient of variation may exceed 100 percent of the average.

TABLE 28

Measures of Stability of Net Operating Income for 18 Types of Farms, 1930-40, and Mortgage Experience in Areas Where They Were Common

Type of farm	Range of net operating income		Standard deviation	Coefficient of variation[a]	Mortgage experience in area
	Low	High			
Central New York					
Dairy	$255	$1,070	$239	32%	Good
Texas Black Prairie					
Cotton	258	1,036	262	35	Fair—good
Southern Wisconsin					
Dairy, eastern	219	1,107	307	41	Good
Dairy, western	165	864	257	46	Poor
Central Kentucky					
Tobacco, livestock	136	1,106	292	49	Good
Intermountain Region					
Cattle ranches	—278	2,492	778	53	Poor—fair
Mississippi Delta					
Cotton	102	901	262	54	Poor—fair
Corn Belt					
Hog, dairy	146	1,688	488	58	Fair—good
Southern Plains					
Winter wheat, grain sorghum	—323	1,363	454	60	Poor—good
Cotton, grain sorghum	23	1,374	429	60	Good
Corn Belt					
Cash grain	—46	2,475	909	63	Fair—good
Southern Plains					
Winter wheat	—199	1,288	403	66	Poor
Southern Piedmont					
Cotton	—77	327	139	81	Poor
Corn Belt					
Hog-beef fattening	—368	2,080	896	90	Fair—good
Hog-beef raising	—227	1,300	507	99	Poor—good
Northern Plains					
Spring wheat, corn, livestock	—383	1,304	570	130	Poor
Spring wheat, small grain, livestock	—613	1,154	594	217	Poor
Spring wheat, roughage, livestock	—533	870	450	260	Poor

For sources of basic data see notes to Table 27.

[a] Standard deviation in percent of average net operating income.

valued higher in relation to financial returns than well-adapted land. To put it another way, rates of return were higher on well-adapted land than on poorly adapted land. Under such circumstances, it follows that if appraisals for loan purposes closely approximate market values for farm land, and if large numbers of loans are made on the basis of a fixed percentage of the

appraised value of the mortgaged properties, then the loans on the poorly adapted land will have less favorable earnings coverage than loans on the well-adapted land.

That appears to have been the actual experience in many areas throughout the United States. Numerous studies of farm income during the interwar period have been made, and many of them reveal the same general relationship between farming returns and land values as were found in Frederick county, the Newfane area, and northern Idaho. Lenders, particularly until the late twenties, apparently were strongly influenced by current market values in making appraisals for loan purposes, and the loan-to-value ratios of a high proportion of their loans fell within a narrow range. As a result, loans on the less productive grades of land had, in many areas, poorer earnings coverage than loans on the better land, and a much higher proportion of them were foreclosed during the interwar period. This, of course, leaves unanswered the question of why deviations between market values and earning capacity persist, and of why lenders, at least during the period under review, failed to adjust loans to the debt carrying capacity of individual farms. These questions, and the problem of adjusting standards to take account of repayment capacity as well as asset values, will be discussed in the next chapter.

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MARKET VALUES, EARNING POWER, AND LENDING STANDARDS

It is a common belief that differences in farm land values depend, in the long run, on farm earning power—except for deviations due to amenities. The differences are regarded as the result of a highly competitive land market, in which the earnings potentials of the various grades of land are constantly reappraised, the more productive properties then being bid up and the less productive beaten down until the rates of return are equalized.

Although that belief has many adherents on the long-run theoretical level, it has few on the short-run practical level. Indeed, the contrary belief is quite general, and farm income studies bear this out, that in the short run the rates of return on different grades of land within an area may be quite unequal. Lack of adjustment between land values and income on different grades of land within a type-of-farming area, combined with the appraisal and lending practices of farm mortgage lenders before the thirties, is commonly accepted as the cause of the traditionally poor mortgage experience on the less productive land in many parts of the United States during the interwar period.

But if deviations between market value and earnings value are so clearly recognized, why do they persist, even in the short run? Why do not the forces of competition come into play and equalize the relation between earnings and market values on all grades of land?

Imperfections of the Land Market

Probably the most important single factor preventing a more precise adjustment of market values to earning power is inadequate knowledge of essential facts on the part of many land buyers and mortgage lenders. This is most strikingly illustrated in newly settled regions where buyers and lenders have to make decisions without benefit of crop yield data, weather records, or soil maps. As a result, serious mistakes may be made in appraising the productive potentiality of a whole region, and many mistakes are almost certain to be made in appraising individual properties. As experience accumulates, appraisals will improve,

but it is noteworthy that progress is often slow, particularly if differences in farming returns within a region trace to causes that are not readily apparent, such as local differences in climate or internal soil drainage.

The process of adjusting market values to earning power may also be retarded by customs or apathy. In northern Idaho, the customary one-third share rental resulted in a price discrepancy between the more productive and less productive lands in relation to earnings, the more productive land being undervalued. Yet mere recognition of the price discrepancy apparently was not sufficient to readjust land values as long as the rental system persisted.

Another deterrent to a good adjustment between land values and earnings on different grades of land within an area is social and technological change, which creates new maladjustments even while existing ones are being eliminated. The productivity of land depends only partly on soils and climate; it is also greatly affected by farming organization and practices—by the crop and livestock systems used, by the insecticides and fertilizers applied, and by the kind and amount of machinery employed. Financial returns from farming depend, moreover, not only on physical productivity but also on price relationships and markets, which frequently change. Over the past several decades we have seen important technological advances that have greatly increased the productivity and profitability of agriculture in general; yet the advances have not affected all farms equally. Often technological advance operates to the disadvantage of some farms by giving other farms a competitive advantage. Population movements or widespread changes in the demand for specific products may have the same effect.

Examples of the disorganizing effect that may sometimes be exerted by rapid technological change on the agriculture of a region are abundant. Among them are the development of railroad transportation in the latter half of the nineteenth century, which had an adverse effect on many types of farming in the Northeast; the development of the automobile, which had an adverse effect on commercial hay producers; and the invention of the cotton picker, which gave producers on the level, high-yield lands of the Mississippi River delta an increased competitive advantage over producers on the hilly eastern piedmont. Examples to illustrate the differential effects of technological change on individual farms within a type-of-farming

area are not so easily found, although it is generally believed that technological change rarely affects all farms in an area equally. One such example is provided by the study of the Newfane fruit area, discussed in the preceding chapter. There was little evidence of variation in average rates of return for Newfane farms according to their soil productivity, in either the 1913-19 or the 1920-29 period. But in 1930-39, after important changes in technology and price-cost relationships, farmers on the best adapted land were earning substantially higher rates of return than other farmers. To do this, they were farming the best grade of fruit land very intensively, and producing a premium grade of fruit for specialty markets.

Limitations of capital are often cited as a cause of differences in rates of return on different grades of farm land within type-of-farming areas. Even in a relatively imperfect land market, the more productive properties may sell at substantially higher prices than the less productive ones. Those higher prices may be insufficient to reflect the higher earning power of the productive properties, and yet more than sufficient to discourage purchasers with little capital. It is not enough for the prospective land buyer merely to recognize that a tract of exceptionally well adapted land is underpriced, and therefore able to earn a higher rate of return than the inferior tracts in the neighborhood. He needs the wherewithal to make the purchase, and although a portion of it can usually be borrowed, the remainder, which may be large, will ordinarily have to be raised in the form of cash. Hence, it is argued, the better-adapted land may consistently sell for less in relation to earnings than the poor land simply because there are relatively few buyers with sufficient cash or credit to pay premium prices.

Amenities and Other Factors

Although imperfections of the farm mortgage and real estate market no doubt account in part for the failure of market values fully to reflect differences in the earning capacity of land, particularly within type-of-farming areas, it should not be overlooked that people buy farms for many reasons other than to obtain a financial return. There are those who farm as an avocation, who buy farms for year-round or summer homes, who practice subsistence or part-time farming, who seek independence or job security in a farm, or who are willing to forgo some financial advantage to live in a congenial neighborhood with

good schools, churches, and other community facilities. As long as persons buying farms for such purposes, and there are many of them, have the necessary purchasing power to make their demands effective, they can affect the market quite as distinctly as do those who buy purely for investment. It would not be surprising, therefore, to find that market values rarely equal earnings values, even in the long run.

Market Values versus Earning Power as Loan Security

The soundness of a long-term loan, whether a farm mortgage, a business loan, or a corporate bond issue, ordinarily rests upon two sources of financial security: first, the market value of the collateral assets that can be seized in case of default or liquidation; second, the earning power of the enterprise, which determines its ability to meet interest charges and avoid default. For years credit men have debated the relative importance of these two sources of security, and in recent years emphasis has shifted from assets toward earning power. The feeling has strengthened that the assets of a business have value and command a price primarily because of their ability to earn a return. Furthermore, the strategic value of the mortgage lien has been limited by legal restrictions deterring creditors from taking actual possession of assets. Bankruptcy courts have frequently argued that the complete dissolution of a business, particularly a railroad or other public utility, is contrary to the public interest and have usually preferred to reorganize a company and keep it in operation. Reorganization often prevents creditors with prior liens, even first mortgage bondholders, from exercising their rights of foreclosure. In much the same fashion, moratorium legislation during the twenties and thirties prevented many farm mortgage holders from foreclosing, and in states where there was no such legislation, mass action by farmers was often sufficient either to prevent foreclosure or to mitigate its effects.

There are, of course, many techniques of appraising farms for loans, but almost all of them can be related to one of two basic methods. One involves an estimate of capitalized earning power —either current or average earnings, usually the latter—and seeks to obtain the going-concern or investment value of the farm. The other attempts to determine what the farm would realize in an actual sale. The latter method, depending upon

needs, might involve an estimate of current selling price, forced-sale price, selling price under an assumed level of farm prices and business activity, or the long-term average selling price. In any case the purpose is to ascertain the collateral or liquidation value, rather than the going-concern value, of the property.

Many writers on farm finance appear to expect an appraisal to do double duty: to reflect simultaneously both the liquidation value and the going-concern value. If the capitalization and market value methods produce different results, some average or compromise value is taken, apparently with the idea that the long-term going-concern value and the long-term liquidation value are basically the same thing. That might be a reasonable expectation if farms were bought and sold by thoroughly competent and informed persons for the sole purpose of obtaining a financial return. Actually, as has been pointed out, the land market is far from perfect. Some buyers are well informed but others are not, and the best informed are not necessarily the ones with the greatest purchasing power. Moreover, regardless of perspicacity or purchasing power, buyers buy for a multitude of reasons. To some a farm is a strictly financial investment. As landlords they may want an investment income from rentals without taking an active part in the actual operation, or as owner-operators they may want a fair investment return on their capital in addition to a reasonable reward for their labor and management. But there are many who are motivated by other than purely financial considerations. Consequently, market values rarely equal going-concern values, and a single estimate cannot adequately reflect both.

In financial analyses of corporations and corporate securities, it is quite common to make several evaluations in order to fit possible contingencies. In the reorganization of a utility holding company, for example, several possibilities arise, and the value of the company to those who own its stocks and bonds varies accordingly. The company may consolidate and become an operating company. It may become an investment trust, relinquishing control over its subsidiaries. It may sell its subsidiaries for cash, which it then pays out to its security holders. It may distribute the actual stocks and bonds of its subsidiaries.

A farm, of course, presents fewer alternatives, but there are still several possibilities. When a loan is closed, the lender hopes that payments will be made regularly and that there will be no other difficulties. Realization of his hopes is more likely if

the farm has stable earnings adequate to cover the payments. But since farming is an uncertain business, the lender must face the possibilities of default and foreclosure, in spite of all efforts to make loans that can be repaid. And if foreclosure does occur, he faces two very different sets of alternatives for dealing with the property. First, he may hold it as an income-producing investment, either through rental or by operating it himself. Second, he may sell it, either for cash or by extending a new mortgage or sales contract. If the lender anticipates the first contingency, he will certainly want an estimate of the income that he will probably derive from operation; and he may or may not capitalize the probable income to obtain a going-concern value for the property itself. If, however, he anticipates the second, he will need a market value appraisal. Some lenders are able to choose whichever alternative appears more attractive. Others, however, are unable to hold the property for income and must perforce sell it; and they will be vitally concerned with the probable resale value. Evidently an appraisal of market values is an important part of most loan analyses, regardless of how the income account is appraised.

Relation of Loan to Long-term Market Value

It is generally held, particularly by those who emphasize market value appraisals, that the amount of a mortgage loan should be substantially less than the long-term market value of the mortgaged property, taken either as a normal agricultural value or as some other average of past or expected future market values. The amount should be such that the property probably can be sold under most circumstances for enough to cover the loan with a margin to spare. The margin of safety protects the lender against a number of contingencies: (1) The property may have to be disposed of in a period of depressed prices. This is a common occurrence because land values fluctuate widely at times and most of the mortgage distress occurs when values are low. (2) Often considerable time is required to foreclose a delinquent property and to find a suitable buyer for it. In the interim there will be an accumulation of taxes, depreciation, and maintenance expenses, which the lender will probably have to assume; there will also be an accumulation of unpaid interest. (3) In spite of care in making appraisals, a few properties will have been overvalued and overgenerous loans extended.

The lender hopes that the safety factor will provide some coverage for those loans. (4) Finally, the borrower derives a psychological impetus if he has a substantial amount of his own capital tied up in the farm. Knowing that he may lose it if the farm has to be sold in a bad market, he may be more inclined to thrift and hard work.

The commonest device for providing such a margin of safety is the limitation of loans to a stipulated percentage of appraised market value. Although farm credit experts have thought much about what constitutes the maximum safe ratio of loan to value, opinions vary. Some lenders will extend a maximum loan of not more than 50 percent of the appraised value. Some will lend considerably more—say 75 percent. Many lenders vary the maximum percentage according to the quality of the property. One large institutional lender, for example, classifies farms in five grades from A to E. The maximum loan on a Grade A farm is ordinarily 60 percent; on a Grade D farm it is only 40 percent. On a Grade E farm, or even a low D, no loan would ordinarily be made. Sometimes the lender will vary the percentage to be loaned on land and buildings. Until recently, for example, the federal land banks would lend 50 percent on land but only 20 percent on buildings.

Varying opinions on the maximum safe loan-to-value ratio may represent more than mere differences in judgment. Lending standards depend upon the lender's own specific requirements. What is suitable for one may be entirely unsuitable for another. In the first place, since appraisal policies are not uniform, each lender must gear his lending standards to his appraisal policy. To a limited extent, at least, conservative loan-to-value ratios can compensate for liberal appraisals and vice versa. A 60 percent loan on a liberal appraisal, for example, might be the equivalent of a 75 percent loan on a conservative appraisal. In the second place, lenders' ability to carry risk varies. Because of liquidity requirements an institution like a commercial bank may be unable to carry a delinquent borrower through a period of general depression; and at the same time it may incur serious losses if it forecloses and sells the property while the land market is still weak. Such a lender must necessarily pursue a more conservative policy than one with less need for liquidity.

But the most important reason for variations in lending standards is the wide geographical differences in lending risks,

which were discussed in Part I. In general, high risk areas like the Great Plains will require more conservative loans than low risk areas like the Northeast. Wherever farms are hard to sell, or where land values fluctuate excessively, lenders are liable to incur losses on foreclosures unless they limit their loans to an exceptionally small percent of probable market value.

Earnings Coverage

In the study of farm income in Frederick county, discussed in the preceding chapter, O. H. White assumed that the maximum possible loan was one for which interest and minimum amortization charges could just be met by net cash income for 1938 less estimated living expenses. If 1938 is considered a normal year, that criterion would appear to provide no margin for safety. In poorer years debt service charges could not be met out of current earnings, except possibly by rigorously curtailing living expenses; and a succession of poor years might produce a cumulative deficit large enough to result in default.

It is difficult to determine, so many years later, how agricultural prosperity in 1938 was appraised on the basis of information then available. Clearly, 1938 was a depressed year for industry, but the historical record of farm income suggests that 1938 may have been viewed as approaching normal for agriculture. For the United States as a whole, net cash income of farm operators in 1938 was $2.4 billion.[1] It was somewhat below the prevailing level of the late twenties—$3.9 billion in 1925, $3.8 billion in 1929—but it was much higher than 1932's $0.9 billion or the $1.4 and $1.6 billion received in 1931 and 1933 respectively. The period 1935-39 is often taken as a base for agricultural calculations. For the United States, net cash income of farm operators in that period averaged $2.7 billion, only slightly above the 1938 amount.

In comparison with the subsequent era of farm prosperity, however, 1938 might well be considered a conspicuously subnormal year. Its net cash income, $2.4 billion, has been exceeded in all subsequent years except 1940, when the total declined somewhat to $2.3 billion, and in recent years has been dwarfed by such records as $10.2 billion in 1946 and $11.7 billion in 1947. A loan that was just covered in 1938 according to White's standards would have been covered many times

[1] *The Farm Income Situation* (Bureau of Agricultural Economics), August-September 1952, Table 17, p. 43.

over during those prosperous years—in fact, could probably have been retired out of two or three years' income.

In corporation finance a substantial margin of safety is customarily provided in calculating maximum debt loads. It is commonly assumed that a corporation should be able to cover interest charges out of current income in all years and have a substantial margin to spare on the average. As a measure of the safety margin, financial analysts often use the ratio

$$\frac{\text{net operating income}^2}{\text{interest charges}}$$

called the times-fixed-charges-earned ratio. One well-known authority states that this ratio, based on average net operating income (before taxes) for seven to ten years, should be at least 4 for a public utility, 5 for a railroad, and 7 for an industrial corporation.[3] If White had used any of those standards, his estimates of the maximum permissible loan would have been greatly reduced.

The margin of safety provided by limiting loans to a fraction of the apparent debt carrying capacity can serve two purposes. First, it supplies a cushion to absorb normal variations in income, which are probably as large in agriculture as in many forms of corporate enterprise. Second, it gives some protection against the ever present possibility of making an excessive loan on the basis of an overestimate of long-term income. Although variable payment mortgages, to be discussed later, are also capable of providing a cushion to absorb variations, they do not give protection against basic overlending.

Adaptation of the principle of times-fixed-charges-earned from corporation to agricultural finance will naturally require modifications and adjustments. Most important, probably, is the adjustment for family living expenses. Off-farm work, unpaid family labor, and amortization also deserve attention.

Adjustment for Living Costs

In corporate financial analysis, net operating income, which appears in the numerator of the times-fixed-charges-earned ratio, is usually regarded as the amount available to meet interest

[2] For definitions of net operating income and other technical terms used in this chapter, see Appendix B.

[3] B. J. Graham and D. L. Dodd, *Security Analysis*, third edition (1951), pp. 320 ff.

charges.[4] That is, interest charges constitute a claim against net operating income that takes precedence over claims by the stockholders for dividends or by the Treasury for income taxes. For a family-sized proprietorship, such as a farm or a corner grocery store, however, net operating income must be divided between interest charges and family living expenses. Although interest charges theoretically take precedence, many farm financial experts take the view that family living costs, at least those required for essentials, constitute in effect a first lien against earnings; hence only income in excess of necessary living costs can be considered available to meet mortgage interest.

Since estimates of farm family living costs are hard to make and not abundantly available, the adjustment of farm income for living costs presents difficulties. Most available estimates—like those of the Bureau of Home Economics, used by White—cover average actual rather than minimum living costs. For farms in land class v, Frederick county, Maryland, average net cash income was $3,450 and average living costs were estimated at $1,398, leaving $2,052 for debt service. It is clear, however, that individual family expenditures must have varied considerably from the $1,398 average, and that many families could, by reducing their actual expenditures, have commanded larger sums with which to meet mortgage payments.

Adjustment for Off-farm Work

On small farms or part-time farms the income from strictly farm operations is often a very poor indication of the capacity to repay debt. If there is real or potential income from nonfarm activities that can be used to help meet mortgage payments, it should be taken into account. Indeed, many part-time farms have no debt carrying capacity in terms of income from strictly farming operations. Yet mortgage experience on such farms is often good because off-farm income can be used to meet mortgage payments.

Adjustments for Unpaid Labor

Some analysts will argue that an adjustment for unpaid family labor, other than that of the operator, is quite as necessary as the adjustment for living costs. Farms with a large number of

[4] Sometimes there is additional, nonoperating income available to meet interest charges. An example would be interest from securities owned by a manufacturing corporation.

boys in the family may be capable of earning a high net operating income merely because of the large amount of unpaid labor. As long as that situation continues, loan carrying capacity will be high. But the boys may leave home, or the farm may pass to a new owner without such a family. The accordingly diminished repayment capacity is more typical of the farm.

Adjustments for Amortization

When the loan contract stipulates amortization, which is now common practice, the mortgagor must be able to meet the interest charge plus an additional amount to retire the loan. Although lenders may be more lenient about deferring the amortization payment than the interest payment, failure to meet either payment often constitutes a legal default.

The effect of the amortization requirement on earnings coverage is not entirely clear. At first it would appear that a correspondingly larger income is required to cover the larger combined payment. That is true when there is no provision for deferring amortization; but with such a provision, expressed or implied, the need for additional income is much less definite.

For example, a farm is estimated to earn $2,000 (net operating income) on the average, and family living expenses are estimated at $1,200, with some leeway under pressure. Can such a farm carry a $10,000 debt at 5 percent interest? The annual interest charge of $500 without amortization is covered 4 times by net operating income, and 1.6 times after allowance for living costs. After interest and living expenses there is an estimated margin of $300 under average conditions, and perhaps $500 with some enforced economy in the home.

If, however, the contract requires level-payment amortization in twenty years, annual charges would be $802, covered 2.5 times before allowance for living expenses and exactly once after the allowance. Average income and expenditures would provide no margin of safety, and enforced economy would provide only $200. With so small a margin, a default is more likely with the amortized loan. But if a default occurs, particularly after several years have elapsed, it will be less serious with the amortized loan. At the end of ten years, for example, the principal amount will have been reduced from $10,000 to $6,193 and the interest payment proper from $500 to $310. If the lender is willing to make adjustments, the principal payment of $492 ($802 less $310) can possibly be deferred during a financial

emergency, or the loan can be refinanced on terms that will reduce the borrower's annual burden. On a new thirty-year loan, say, the total annual payments would be only $403, about half the original $802.

In the early years of a long-term level-payment contract, annual payments consist mainly of interest with very little amortization, and a generous adjustment of the type described above is hardly feasible—unless the lender is willing to reduce the interest rate or make the borrower an outright gift of part of the principal. Suppose that the hypothetical farm family above borrowed $13,100 for 35 years instead of $10,000 for only 20 years. The larger, longer-term loan has the same annual payment of $802 as the other, but the annual amount of amortization is much smaller, being only $117 the first year as against $302 for the $10,000 20-year loan. At that rate the farm family would have to wait 25 years before the loan could be refinanced on a new 30-year basis with payments reduced to $103.

The Variable Payment Mortgage

Some farm financial experts advocate variable payment mortgage contracts, according to which annual payments vary with farm income.[5] In poor years amortization of principal and even interest could be skipped, in good years substantial prepayments required. The land banks, without actually adopting variable payment contracts, have achieved a somewhat similar effect in practice. They extend to deserving borrowers privileges of reducing or waiving payments in bad years, and they encourage farmers to make prepayments during prosperous years.

The variable payment mortgage is designed to adapt the otherwise inflexible mortgage contract to the typically variable incomes of agriculture. It offers the farmer a means of avoiding embarrassment or in some cases disaster when his income falls temporarily below its normal level. But the advantages of variable payments cannot be realized unless long-term debt-carrying capacity is conservatively estimated. According to a recent publication, "Variable payments may serve to decrease delinquency, but do not necessarily aid in paying off the loan; that is, variable payments cannot be expected to compensate for misjudgments in long-run debt-paying ability, for over-

[5] See, for example, *Improving Land Credit Arrangements in the Midwest* (Purdue University Agricultural Experiment Station, Bulletin 551, June 1950), pages 31-39.

lending, or for serious errors in appraisal. No system of variable payments can be expected to deal with the non-business demands on farm income. Examples are heavy family expenditures for medical purposes and decreases in income which result from faulty management."[6]

Earnings Coverage, Loan-to-value Ratios, and Rates of Return

When farm appraisals are made strictly according to the capitalization method, a simple and direct relation exists between times-fixed-charges-earned and the loan-to-value ratio. Suppose, for example, that a lender's standards stipulate the following: appraisals will be made by capitalizing the estimated net operating income at 5 percent; loans will be limited to 66 2/3 percent of the appraised value; and interest will be at 5 percent. This is equivalent to requiring that interest be covered at least one and one half times according to the ratio

$$\frac{\text{net operating income}}{\text{interest charges}}$$

as is shown in Example A below:

	Example A	*Example B*	*Example C*	*Example D*
Net operating income	$1,000	$1,000	$1,000	$1,000
Capitalization rate	5%	5%	6%	5%
Appraised value (capitalization basis)	$20,000	$20,000	$16,667	$20,000
Maximum loan ratio	66 2/3%	50%	66 2/3%	66 2/3%
Maximum loan	$13,333	$10,000	$11,111	$13,333
Interest rate	5%	5%	5%	4%
Annual interest charge	$667	$500	$556	$533
Times-fixed-charges-earned	1.5	2.0	1.8	1.9

Examples B, C, and D show that greater interest coverage can be achieved if the maximum loan-to-value ratio is reduced, say, to 50 percent; or if the capitalization rate is increased, say, to 6 percent; or if the interest rate is lowered, say, to 4 percent.

When farm appraisals are based partly or wholly on market comparisons, rates of return usually vary from farm to farm, exerting a considerable influence on earnings coverage. In the table below, five hypothetical farms are appraised at $20,000 each (basis, long-term market value):

[6] *Ibid.*, pp. 31 f.

Examples Showing the Effect of Profitability on Earnings Coverage

	Farm A	*Farm B*	*Farm C*	*Farm D*	*Farm E*
Appraised market value	$20,000	$20,000	$20,000	$20,000	$20,000
Return on real estate investment	$1,000	$1,200	$1,200	$1,200	$2,000
Rate of return	5%	6%	6%	6%	10%
Loan-to-value ratio	66.7%	66.7%	60.0%	50.0%	66.7%
Amount of loan	$13,333	$13,333	$12,000	$10,000	$13,333
Interest rate	5%	5%	5%	4%	5%
Interest charge	$667	$667	$600	$400	$667
Times-fixed-charges-earned	1.5	1.8	2.0	3.0	3.0

Farm A is assumed to have a somewhat poorer soil than the others; but it has a larger and better farm dwelling, which suffices to equalize market values. Thus Farm A earns only 5 percent on appraised value, or $1,000; whereas Farms B, C, and D earn $1,200, or 6 percent. Farm E earns 10 percent through a combination of better-than-average soil and management. The farm dwelling, however, is somewhat below community standards, and the market value of the farm is estimated to be $20,000.

As between Farms A and B, the only difference is in the rates of return, which give a slightly better times-fixed-charges-earned coverage for Farm B; the loan-to-value ratios are the same. Farm C has a dual advantage over Farm A. Not only is it more profitable, but the loan-to-value ratio is lower; hence Farm C is carrying a smaller interest burden with a bigger income. Farm D has a still lower loan-to-value ratio and a lower rate of interest. The result of that combination is a times-fixed-charges-earned ratio of 3.0—just twice that of Farm A. To produce a comparable coverage on Farm A would require a loan-to-value ratio of 33 1/3 percent instead of 66 2/3 percent. Farm E also covers its interest three times; but that is due solely to the extraordinarily high rate of return, for Farm E has the same size of loan and the same interest burden as Farm A.

The foregoing examples indicate that good interest coverage can be achieved either through an ultraconservative loan or through a rate of return substantially higher than the mortgage interest rate. Thus it is clear why farm mortgage lenders prefer the following three types of borrowers: first, the man who makes

a substantial down payment on his farm or otherwise acquires a substantial equity, giving assurance of a conservative loan; second, the man who buys his farm at a bargain price in terms of its earning capacity and finances it on a conventional basis; and third, the man who is an uncommonly efficient operator. The third type, of course, involves some risk, for the efficient operator may die or sell out and be replaced by someone who is less efficient.

9

CHIEF CAUSES OF MORTGAGE DISTRESS, RECENT ADJUSTMENTS, AND CONTINUING PROBLEMS

FARM mortgage distress in the United States during the interwar period cannot be explained by any one cause, or even by any specific combination of causes. Although most of the distress had its origin in the World War I boom and the two postwar slumps, there were other important contributing factors, which are evidenced by the pronounced variations in distress that occurred among geographic areas and even among individual farms within areas. Among the contributing causes are: differences in price behavior and in inflation of land values and debts; problems of settlement in new areas; natural hazards such as weather and insect pests; high fixed costs; technological changes; and the common difficulty of properly differentiating between good land and poor land in making loans. Complicating factors in many instances were unwise loan practices and unsound financial condition of banks and other lenders.

Differences in Price Behavior

Farm prices, incomes, and debts did not increase equally in all parts of the country during the wartime boom, nor did prices and incomes decline equally in the depression years. Prices of food grains and meat animals, for example, averaged higher during the period 1915-19 in comparison to the prewar level than did prices of dairy products, but after the war their relative decline was much the greater (Table 29). The price of cotton rose to comparatively higher levels during the war years and remained at higher levels during the early twenties than did prices of dairy products, but its decline during the thirties was more severe.

These differences in price behavior partly account for differences in the severity of distress that developed in various parts of the country. They help to explain, for example, why debt distress developed early and was more severe in the Great Plains, which produces livestock and grain, than in the Northeast, which produces large quantities of dairy products. They also help to explain why the great cotton-producing areas of the

TABLE 29

Index Numbers of Prices Received by Farmers for Selected Crops and Livestock Products, 1915-39

(1910-14 = 100)

Product	*1915-19*	*1920-24*	*1925-29*	*1930-34*	*1935-39*
Dairy products	147	159	161	105	119
Meat animals	162	121	145	83	117
Food grains	193	147	141	70	94
Cotton	175	197	150	77	87
Tobacco	183	189	169	117	172
Fruit	126	157	146	98	95

From *The Agricultural Situation* (Bureau of Agricultural Economics), Vol. 37, No. 1 (January 1953), page 15.

delta country avoided acute distress until the thirties. They do not, however, explain why distress came to the eastern Cotton Belt a whole decade earlier than it came to the delta area; nor do they entirely account for the severity of debt distress in the Great Plains.

Inflation of Land Values and Debts

Shortly before 1900 American agriculture entered a period of general prosperity, which had a pronounced effect on the level of land values. Prices of agricultural products rose more or less steadily for a period of approximately twenty years culminating in the World War I boom. Naturally, farm incomes followed suit. Land values also rose—mainly because of improved farm incomes, partly because of generally rising prices, and also because relatively little land was available for homesteading after 1900. The average value of farm land and buildings in the United States, as reported by the census, was approximately $20 per acre in 1900, $40 in 1910, and $69 in 1920.[1]

But rises in land values varied greatly throughout the nation, just as price rises varied greatly among products. Large percentage increases in land values between 1910 and 1920 were especially conspicuous in the cotton and tobacco areas of the Southeast; in a small but intensive cotton area in the delta region of northwestern Mississippi; in the cotton areas of northeastern Texas and southeastern Oklahoma; in the northwestern part of the Corn Belt; and in a number of fruit and vegetable

[1] *Historical Statistics of the United States, 1789-1945* (Bureau of the Census, 1949), p. 95.

areas in Florida, southern Texas, and central California (Figure 3, Chapter 1). In some of those areas, moreover, the rapid rise in land values was clearly a speculative phenomenon, accompanied by a marked increase in farm mortgage debt. An example is the northwestern section of the Corn Belt, which is an excellent farming area. In contrast with the Great Plains and the eastern Cotton Belt, the northwestern Corn Belt was not confronted during the interwar period with major adjustments in size of farm and in type and methods of farming, nor was it confronted with serious production problems except during the drought years of the thirties. But the heavy debts that had been piled up during the period of high wartime prices and sharply rising land values became a serious burden to farmers in the northwestern Corn Belt. Although most of these debts might have been carried, and even slowly retired, under the price level that prevailed during the twenties, they could not be carried under the price level that existed in the thirties.

A state by state comparison of the World War I land boom with subsequent debt distress is afforded by Table 30, which gives the percentage increase in mortgage debt from 1910 to 1920, the percentage increase in land values from the 1912-14 base to 1920, and the average number of distress transfers in 1925-34 per thousand mortgaged farms in 1930. It is clear that distress transfer rates are positively related to the increases in mortgage debt and slightly less closely related to the increases in land values.[2] Nevertheless, the relationships are not as striking throughout as they were shown to be for the Corn Belt (see Table 12, Chapter 3), where soils, climate, and types of farming are far more uniform than in the United States generally.

A graphic comparison between distress transfers and the rise in mortgage debt during the decade 1910-20 appears in Figure 39. The scatter diagram shows most of the states—indicated by unidentified dots—forming a consistent pattern in which distress transfers are closely related to previous debt increases. Ten states—indicated by name—fall far outside the pattern.

[2] The product-moment correlation coefficients work out to +0.60 between distress transfers and rise in debt, +0.46 between distress transfers and rise in land values, and +0.15 between rise in debt and rise in land values. The statistical significance of these coefficients and particularly of the differences between them is doubtful at best. Moreover, the standard tests of significance are not strictly applicable here because conditions in one state are usually related to conditions in the surrounding states.

TABLE 30

World War I Inflation and Subsequent Debt Distress
(states arranged in order of percentage increase in mortgage debt)

State	*Increase in estimated farm mortgage debt 1910 to 1920*[a]		*Increase in estimated land values per acre from 1912-14 to 1920*[b]		*Average annual distress transfers, 1925-34, per 1,000 mortgaged farms in 1930*[c]	
	Percent	Rank	Percent	Rank	Percent	Rank
Rhode Island	12%	1	30%	3	11.4%	2
New Jersey	33	2	30	4	18.3	4
Pennsylvania	48	3	40	10	29.1	7
Massachusetts	52	4	40	11	13.4	3
New Hampshire	52	5	29	2	21.2	6
New York	56	6	33	6	31.9	9
Maine	61	7	42	14	37.3	12
Connecticut	63	8	37	8	10.1	1
Delaware	66	9	39	9	32.6	10
Maryland	81	10	66	25	40.5	16
Vermont	93	11	50	17	21.1	5
Indiana	93	12	61	23	49.1	25
Michigan	94	13	54	19	48.0	24
Ohio	97	14	59	21	47.6	22
Illinois	99	15	60	22	57.6	30
Missouri	103	16	67	27	66.1	36
Kansas	111	17	51	18	58.4	32
West Virginia	130	18	54	20	56.6	29
Wisconsin	136	19	71	30	38.6	14
Washington	161	20	40	12	42.2	19
Louisiana	161	21	98	39	55.4	27
Iowa	176	22	113	42	72.5	43
Oregon	176	23	30	5	36.4	11
Texas	181	24	74	32	37.5	13
South Carolina	189	25	130	48	78.1	46
North Dakota	192	26	45	16	62.3	34
Alabama	194	27	77	34	52.5	26
Virginia	202	28	89	38	72.2	42
Mississippi	203	29	118	45	70.9	41
Nebraska	215	30	79	36	58.1	31
Kentucky	222	31	100	40	66.9	37
Minnesota	236	32	113	43	64.5	35
Oklahoma	245	33	66	26	47.1	21

(continued on next page)

TABLE 30 (continued)

State	*Increase in estimated farm mortgage debt 1910 to 1920*[a]		*Increase in estimated land values per acre from 1912-14 to 1920*[b]		*Average annual distress transfers, 1925-34, per 1,000 mortgaged farms in 1930*[c]	
	Percent	Rank	Percent	Rank	Percent	Rank
South Dakota	272%	34	81%	37	88.8%	48
California	276	35	67	28	40.2	15
North Carolina	293	36	123	47	72.5	44
Georgia	296	37	117	44	72.7	45
Tennessee	312	38	100	41	69.5	39
Colorado	314	39	41	13	60.9	33
Nevada	345	40	35	7	45.6	20
Wyoming	383	41	76	33	41.5	18
Arkansas	384	42	122	46	56.5	28
Florida	459	43	78	35	40.9	17
Idaho	483	44	72	31	47.6	23
Utah	493	45	67	29	29.2	8
New Mexico	556	46	44	15	88.3	47
Arizona	689	47	65	24	70.5	40
Montana	906	48	26	1	67.9	38

[a] Calculated from mortgage debt figures as of January 1 presented in *Farm-Mortgage Credit Facilities in the United States*, by Donald C. Horton, Harald C. Larsen, and Norman J. Wall (U.S. Department of Agriculture, Misc. Pub. No. 478, 1942), Table 64, pages 219 ff.

[b] Calculated from price indexes as of March 1 given in *The Farm Real Estate Situation, 1946-47*, by A. R. Johnson (U.S. Department of Agriculture, Circular No. 780, March 1948), Table 1, page 4.

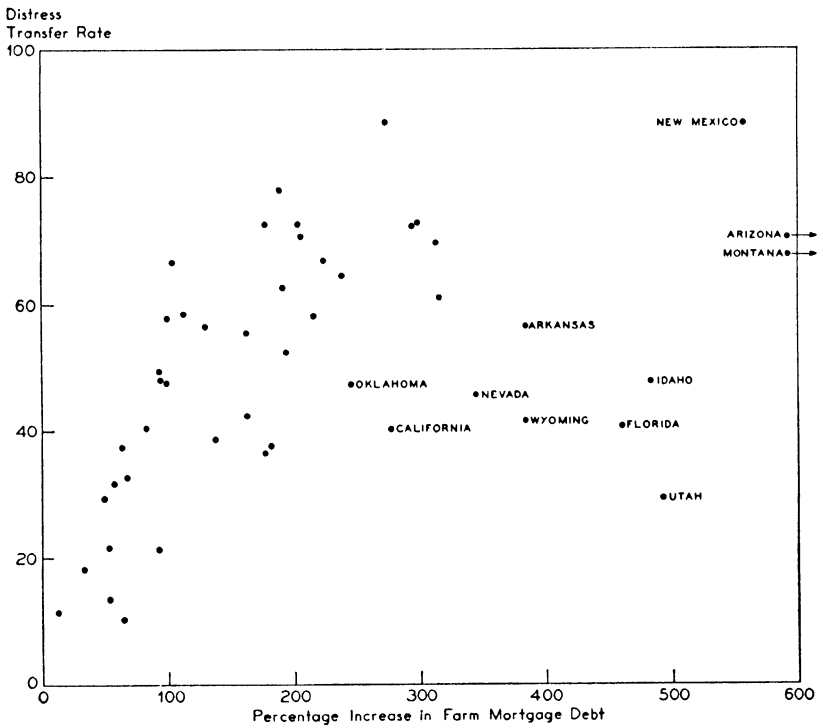
[c] See Figure 7.

Virtually all of the latter are states like Montana, where a large amount of land was being settled. In such states the mortgage debt outstanding in 1910 was small, and a very large percentage increase could easily occur during the ensuing decade, even without an undue amount of real estate inflation. Utah probably affords the best example of an area where a large percentage increase in debt was built upon a sound agricultural basis.

In Table 30 there appears to be virtually no relation between the rise in mortgage debt and the rise in land values. In fact, the state with the largest increase in debt, Montana, had the smallest increase in land values. Among numerous explanations that can be found for this apparent contradiction, two are note-

worthy. The first, already mentioned, is that in recently settled states a relatively small increase in the absolute volume of the debt may be a very large increase percentagewise. The second is that land values in the recently settled states probably rose

Figure 39. Relation between Increase in Farm Mortgage Debt, 1910-20, and Distress Transfers of Farms, 1925-34



Distress transfer rate is the average annual number of foreclosures, and assignments to avoid foreclosures, over the period 1925-34 per thousand mortgaged farms in 1930, see Figure 7. Data on mortgage debt are from Table 30. For comment on the states named, see text.

more rapidly than the index indicates, because the most recent land to be taken into cultivation tended to be the poorer and cheaper land, which pulled downward, in the average, against the more expensive, previously settled land.

Newly Settled Areas

Some of the worst mortgage trouble spots that developed during the interwar period were in areas that had been settled from 1900 through the middle 1920's by people unacquainted

with the physical limitations of the regions in which they located. In some of the newly settled areas the natural productivity of soils and climate was too low to permit any type of arable farming on a profitable basis. In others, the physical limitations of the region called for the adoption of specialized farming practices, which were developed only after painful experience with unsuitable methods. It is true that the prices of wheat and other grains rose sharply during and immediately after World War I and greatly stimulated the increase of crop acreage, land values, and farm debts in the Great Plains. It is also true that the prices of grains declined very rapidly in the early twenties. But the rapid rise and fall in the price of one of the principal products of the Great Plains does not fully account for the severity of the debt distress there during the interwar period.

To be profitable over the long run, crop farming in the plains must be carried on by extensive, dry-farming methods and on relatively large units. During the period of heaviest settlement (1900-1920) rainfall over large sections was above average, and the year to year distribution was somewhat better than normal. This, together with the high prices for wheat during the World War I period, not only encouraged the introduction of crop farming into areas unsuited for it in the long run, but in many cases encouraged inexperienced settlers from farther east, where rainfall was both more plentiful and more dependable, to settle on farms that were much too small to constitute economic units in a semiarid region. Adaptation of size of farm to the needs of an extensive agriculture was greatly hindered by the Homestead Act, which even as liberalized in 1909 and 1916 limited each settler to 320 acres for crop farming and 640 acres for stock raising.

Not only were the typical sizes of farms and much of the early farming technology in the Great Plains unsuited to that region, but the banking and credit institutions introduced to finance agriculture were, if anything, even less well adapted. In 1914 there were 4,712 commercial banks in the twelve Great Plains and Mountain states.[3] By 1919 the number had increased to 5,484. Most of them were small local institutions. Even in 1919, deposits averaged only $416,000 per bank. A substantial proportion of the banks' assets consisted of loans to local

[3] *Banking and Monetary Statistics* (Board of Governors of the Federal Reserve System, 1943), pp. 24-33.

farmers and ranchers—this in a region subject to violent fluctuations in both production and prices.

Nor were insurance companies, mortgage loan companies, or federal and joint stock land banks much better organized to make sound loans in the Great Plains during the World War I boom. The land banks were newly organized and inexperienced in making loans; and many insurance and mortgage loan companies were still buying farm mortgages from local brokers or making mortgage loans through local agents or loan correspondents. Most brokers and local representatives of eastern lenders were engaged in other activities, including the sale of farm real estate, and few of them had extensive experience either in farm appraisal or in making farm loans. Although there is no direct evidence on the point, it appears that lenders shared in the general optimism of the borrowers and made loans that in the light of future developments were far out of line with the long-term earning power of the farms and ranches financed.

In the cut-over areas of the Lake states, where settlement continued into the twenties, and in southeastern Oklahoma, mistakes were made during the World War I period that were in some respects similar to those made in settling the Great Plains. Usually there was not the problem of adjusting size of farm and production practices to the requirements of a semiarid climate, although in southeastern Oklahoma many farm units were established that were much too small for efficient operation. But there were limitations both in the cut-over country and in southeastern Oklahoma imposed by the character and quality of the soils, which, over large areas, are relatively unproductive. A short growing season and occasional dry years constitute additional limitations in parts of the cut-over country. The settlers seem not to have recognized those limitations; at least they did not take them sufficiently into account. During the long period of rising agricultural prices and land values that culminated in the wartime boom of 1915-20 they eagerly bought land and contracted debts in both areas on a basis that could be justified only on the assumption that agricultural prices would continue at high levels. Under the impact of less favorable prices in the twenties and the price collapse of the thirties, farm incomes fell to a point where borrowers in these sections of relatively low yields could not meet their obli-

gations, and lenders acquired a large amount of farm real estate.

For the most part, agriculture in the Pacific Coast states during the interwar period appears to have been rather well adjusted to the widely varying soils and climatic conditions of the region. Mistakes were made, however, during the period 1910-20 in settling some of the areas in Washington and Oregon east of the Cascades. Under the impetus of wartime prices and favorable weather, crop farming pushed into a number of semi-arid areas unsuited for it in the long run, just as it did in parts of the Great Plains. Cut-over areas were settled that proved capable of supporting little more than a subsistence type of agriculture in normal times. In still other areas, irrigation works were installed at considerable expense. Although production was not usually a problem in the irrigated areas of the Northwest, except where drainage difficulties were encountered, taxes for operation, maintenance, and debt service of irrigation districts plus debt service on individual farm mortgages frequently proved a greater financial burden than could be carried during periods of low agricultural prices. In some areas, such as the Wenatchee fruit section in central Washington, many individual farm units were too small for efficient operation, and in some cases orchards were planted on soils that proved to be submarginal for fruit production except during periods of high prices.

Natural Hazards

Unfavorable weather, noxious weeds, plant diseases, and insect pests added greatly to farmers' debt difficulties in some sections of the United States during the twenties and thirties. In periods when agricultural prices are reasonably well adjusted to costs, natural handicaps to production are seldom the sole cause of farm mortgage foreclosure, although they are frequently a contributing cause. In normal times, most farmers can survive an occasional dry year or a season in which hot winds, hail, frost, weeds, insects, or diseases reduce crop yields or even cause a complete crop failure. But a series of poor crops, or even a single crop failure following a number of years in which agricultural prices have been at low levels, may result in financial disaster.

In almost every year during the thirties some part of the Great Plains was affected by drought, and in 1934 and 1936 the entire region suffered from droughts of unusual severity.

Even if agricultural prices had not been at low levels, it seems clear that large numbers of farmers and ranchers would have been unable to meet their financial obligations because of crop failures. As it was, the combination of low prices and poor crops resulted in severe and widespread farm mortgage distress in the Great Plains between 1930 and 1940, and there was even an emigration from the areas most affected.

Although drought does not appear to have been the direct cause of many distress farm transfers outside the Great Plains and Mountain states during the interwar period, it was undoubtedly a contributing factor in other areas, especially during the first half of the thirties, when agricultural prices were still relatively low and drought was widespread. In the same period hot winds, hail, and frost reduced crop yields in a number of areas and added to existing debt difficulties caused by low agricultural prices. Severe winters in the middle thirties killed large numbers of apple trees in western New York and citrus trees in Florida, which undoubtedly led to some foreclosures that would not otherwise have occurred.

Insect pests, noxious weeds, and plant and animal diseases exact a heavy financial toll each year from American agriculture. In some cases this toll takes the form of reduced production; in others it takes the form of cash outlays to cover the cost of control measures. Occasionally, an insect pest or disease presents such a serious control problem that it forces far-reaching changes in the agriculture of an area. The boll weevil appears to have precipitated such a change in parts of the Cotton Belt during the interwar period. During World War I cotton yields were good and farm incomes high in the eastern cotton-producing states of Georgia and South Carolina. Both land values and farm mortgage debt increased sharply in the two states. Then came the price break of the early twenties, which happened to coincide with severe boll weevil damage. It is estimated that in Georgia the reduction in cotton yields caused by the boll weevil was 45 percent in 1921, 44 percent in 1922, and 37 percent in 1923. In South Carolina the greatest reduction was in 1922, estimated at 40 percent. At the same time, prices received by farmers for cotton, which had averaged 35.3 cents per pound during the 1919-20 marketing season, averaged only 15.9 cents per pound during the 1920-21 season and 17.0 cents per pound during the 1921-22 season.[4]

[4] *Agricultural Outlook Charts—1950* (Bureau of Agricultural Economics, 1949), p. 71.

Confronted with low cotton yields on the one hand and relatively high costs and debt service charges on the other, farmers in the eastern Cotton Belt were in serious financial straits during the twenties even though cotton prices recovered from the early postwar break and averaged 20.2 cents per pound during the marketing seasons 1922-23 to 1929-30, inclusive. The need for a shift from almost complete dependence on cotton as the principal source of farm income in the eastern cotton states was clearly indicated. But the problems of agricultural adjustment were greatly complicated by the fact that the boll weevil forced the beginnings of such a shift during a period of agricultural depression. It is not surprising that there were many financial failures in the eastern Cotton Belt during the interwar period and that farm mortgage foreclosures and loss rates there were among the highest in the United States.

High Fixed Costs

Virtually all types of farming in the United States are characterized by fixed costs in varying degree, but there are certain types of farming where fixed costs are high enough to contribute substantially to farmers' financial problems in periods of declining prices. Probably the most spectacular examples of debt distress during the interwar period resulting from high fixed costs were those in intensively farmed areas with expensive drainage or irrigation projects. High taxes in drainage districts were an important contributing cause of debt distress in the delta areas in Arkansas and Mississippi. Farmers in some of the irrigated sections of the Pacific Coast states found themselves faced with a combination of high irrigation assessments and extremely high mortgage debt charges, which contributed to acute debt distress in that region.

Technological Change

Technological progress is commonly recognized as a primary cause of American productivity and prosperity; yet it often brings with it maladjustments that result in great hardship for individuals. During World War I and the interwar period, progress was rapid, both in agriculture and industry, and it produced a number of notable maladjustments either by reducing demand for specific products and services or by reducing unit costs for some producers, who were then able to undersell their less fortunate competitors.

An important technological advance in the twentieth century was the development of synthetic fibers by the chemical industry, including rayon and nylon, which have partly taken the place of natural fibers. Undoubtedly the synthetics exerted a depressing effect on the price of natural fibers, including cotton, and may, therefore, have contributed in a small way to some of the distress that occurred in the Cotton Belt.

The development of automotive power had widespread effects on agriculture. It had an immediate effect on farmers who produced hay for sale in cities and in deficit hay-producing areas such as the South. There were many commercial hay growers in the Northeast, some of whom were able to turn their farms to other uses, while others were forced out of business entirely. But automotive power had an even more important effect on methods of production and hence costs. Tractors supplanted work animals on the farm, which reduced costs in many cases and released thousands of acres of land previously used for growing feed for draft animals.

The shift to tractor power clearly increased the efficiency of farmers who were able to take full advantage of the new machine methods. Conversely, those who were unable to use modern machinery to advantage, either because of topography, or of small holdings, or for other reasons, were placed at a competitive disadvantage.

Many technological advances seem to have had the effect of increasing differentials in the economic value of different grades of land being used for the same type of farming. There is considerable evidence that within type-of-farming areas, technological changes during the interwar period increased operating incomes relatively more on farms with few production handicaps than on less well adapted farms. The introduction of hybrid seed corn, for example, effected the greatest increases in corn yields and farming returns in those parts of the Corn Belt with climate and soils best adapted to corn production. Likewise, better control of plant diseases and insect pests and use of commercial fertilizers increased the production of marketable fruit per acre more for orchards with deep, well-drained soils than for orchards with poorly drained soils. Such developments may explain in part the better than average loan experience on the more productive land classes. Even if earning coverage had been the same on comparatively poor as on good land in 1920, it appears that by the early thirties the poor land in

many type-of-farming areas would have been at a decided disadvantage through its lesser share in technological gains.

There are examples, of course, of technological changes that increased the earning power of land with physical production handicaps more than the earning power of land with few such handicaps; but within type-of-farming areas there appear to have been few cases of that kind compared to the number where the reverse situation developed.

Mistakes in Making Loans

Much of the debt distress that developed during the interwar period is traceable to overlending, particularly during the World War I period. Loans were made that seemed sound at the time, but later proved excessive in terms of long-term earning power. Furthermore, there is substantial evidence that overlending occurred more frequently on farms and in areas with marked production limitations[5] than on farms and in areas with few limitations. Studies of farm income, including those reviewed in Chapter 7, offer numerous examples of type-of-farming areas where farms on the less productive grades of land earned a lower rate of return and had less loan carrying capacity than farms on the better grades. And statistical studies of lending experience have shown repeatedly that mortgages made on the less productive farms within an area were more likely to end in foreclosure and serious loss than mortgages on the more productive farms.

It is often suggested that the poor financial experience observed on less productive farms and in less productive areas is due to an inability of the farm land market, at least in the past, to differentiate adequately among individual farms in an area or among neighboring areas with different degrees of productivity. Failure to allow fully for differences in productivity seems likely to be especially important in newly settled areas and during periods of rapid technological and economic change. As a result of such failures, it is argued, farms in the less productive land classes are likely to sell in many instances for more than their long-term earnings prospects would justify even after appropriate adjustments for differences in home values and related amenities; and if loans are made on these farms on the basis of appraised market value, they are almost certain to be excessive loans.

[5] Limitations imposed by soils, climate, topography, or location.

But why should the farm land market have difficulty in setting values that accord with earnings prospects? Farm land is a highly variable commodity, with no two farms exactly alike. Differences in soils and climate, which may have an important bearing on farming returns, are not always recognized by the prospective buyer, or if recognized, may not be taken sufficiently into account in arriving at an offering price for a particular farm. Even if information concerning past earnings is available, which is seldom the case, it is difficult to disentangle and give proper weight to factors that may alter earning power in the future. Under the circumstances it is not surprising that even professional appraisers should make mistakes in estimating the earning prospects of individual farms, or even of whole areas. Although mistakes of all sorts may occur, there is one type that is particularly likely to result in eventual mortgage difficulty. It is the overappraisal of a marginal farm. The opposite type of error, which occurs when a high grade farm is underappraised or sold at a bargain price, is naturally much less likely to result in difficulty.

Accurate appraisals are especially difficult in areas where soils are highly variable or in areas characterized by local variations in climate. An example is the fringe area between the cut-over country and dairy belt of the Lake states, which has highly variable soils. Much of the distress that developed there during the interwar period appears to have been the result of the failure of the early settlers and lenders to distinguish the better agricultural land from land with serious production limitations.

But the frequency with which overpricing of poor land seems to occur suggests that there is more involved than mere random errors of appraisal or lack of knowledge on the part of new settlers. Some writers have argued that the errors of appraisal are not random at all, but are biased in the direction of overvaluation of poor land and undervaluation of good land. A possible alternative view is that overvaluation of poor land is apt to occur mainly in periods of prosperity and inflation. It is a plausible view because, obviously, land that is inferior or marginal in the long run may earn a very handsome rate of return during temporary periods of high prices for agricultural products. If, in addition, land values in general are undergoing a speculative rise, the values of inferior or marginal land are almost certain to rise too.

The argument has to be taken largely on its logical merits, for there are no series showing movements of land values for different grades of land. Nevertheless, there is evidence that just such a development occurred in northern Missouri and southern Iowa (area G in Figure 23, Chapter 1) where foreclosures were notoriously high during the interwar period. The area is better than marginal, but at the same time it is definitely inferior to central Iowa, because of rough topography or poor drainage. Yet when the speculative land boom struck central Iowa, southern Iowa and northern Missouri were greatly affected, and eventually land values reached levels that might have been justified under World War I prices for corn and hogs, but proved thoroughly unsound under prices prevailing for the next two decades. It is generally believed that a similar phenomenon of temporary speculative overappraisal occurs repeatedly in the stock market. During a bull market and business revival, normally low-priced securities of corporations with poor long-term earnings prospects are likely to rise rapidly as earnings reports begin to show substantial improvement. Ordinarily the low grade securities rise much faster than the rest of the market, which gives rise to the famous "square root" law.[6] But as soon as the market decides that the period of high earnings is temporary and that the low grade securities are, therefore, overvalued, they fall in price, perhaps even more rapidly than they rose.

Not all of the mistakes in making mortgage loans on land with production handicaps result from improperly appraising the market value of such land, however. People buy farms for many reasons besides obtaining a financial return, and the nonfinancial considerations also influence land values. Furthermore, some buyers may appraise properly the differences be-

[6] The law states that prices of variously priced stocks rise in such a way that changes in their square roots tend to be constant. Thus, in a strong bull market, the likelihood that a low-priced stock selling at $9 will eventually reach $36 is as great as the likelihood that a high-priced stock selling at $81 will eventually reach $144. The increase in the square root for the $9 stock ($\sqrt{36} - \sqrt{9} = 6 - 3 = 3$) is the same as the corresponding increase for the $81 stock ($\sqrt{144} - \sqrt{81} = 12 - 9 = 3$); yet the price increases amount to 300 percent for the $9 stock and only 78 percent for the $81 stock. Cf. "The Relationship between Price Change and Price Level for Common Stocks," by Zenon Szatrowski, in *Journal of the American Statistical Association* (Vol. 40, No. 232, Part 1, December 1945, pp. 467-83), and "Finding Actual Price Distortions: Simple 'Square Root' Formula Equalizes Varying Percentage Movements," by Harry D. Comer, in *Barron's National Business and Financial Weekly* (Vol. 24: March 13, 1944, p. 16; March 20, 1944, p. 7).

tween farms in earning capacity and yet have insufficient purchasing power to compete for the better ones. If well-informed buyers with limited capital compete for the cheaper farms, instead of retiring from the land market altogether, the result is that farms with recognized production limitations may consistently sell for prices that are high in relation to earning power. It does not follow that these farms are overpriced or that market appraisals of them for loan purposes are erroneous. The problem here is one of adjusting size of loan to debt paying capacity, which can be achieved by limiting the amount loaned to a smaller fraction of appraised market value than that considered safe for the more productive properties.

Recent Adjustments

Since 1914, when the outbreak of World War I began to set the stage for the debt distress following 1920, there have been a number of developments in American agriculture that appear to have mitigated, at least to some extent, the price and production hazards of farming. A few of these may be mentioned.

1. Government farm price support programs have been introduced, which, if continued, will have a stabilizing effect on the prices of the products supported. Many farm products are not eligible for price support, however. Nor is it by any means certain that prices can or will be supported at levels that will permit farmers to pay off heavy debts contracted during inflationary periods such as the present.

2. Great advances have been made in controlling plant and animal diseases, insect pests, and weeds. Control measures are often costly, but they promise greater freedom from catastrophic losses in the future.

3. Although science has been able to do nothing yet to prevent recurring droughts in the Great Plains and elsewhere, it has provided better varieties of wheat, new techniques of conserving moisture, and machine methods that facilitate combining small holdings into units of economic size. All these tend to mitigate the effects of drought. In areas where rainfall is sometimes excessive, it has been possible through the use of modern farm machinery to reduce production losses substantially by expediting operations during intervals between periods of bad weather.

4. Government crop insurance schemes may eventually enable farmers to avoid part of the heavy financial losses resulting

from catastrophic crop failure. At present, however, crop insurance is on an experimental basis; it is available in a rather small number of counties, and it covers only a few staple crops. Naturally, insurance premiums are high in areas of high risk, but since they are a budgetable expense, they could be a help to borrowers and lenders in the attempt to adjust loans to farm incomes. So far, however, farmers in high risk areas have been reluctant to pay the necessary premiums.

5. A great deal more is known today about production limitations imposed by soils and climate than ever before. Soil maps and weather records are more generally available, and those who are willing to take pains in using them can avoid the worst errors of purchasing farms or making loans on land with production limitations. During the past twenty-five years a great deal of effort has been expended on improving appraisal practices and loan standards.

6. In the South (a chronic trouble area during the interwar period) adjustments have been made possible by wartime prosperity and shifts of population, by research, and by federal farm programs. These adjustments have had the effect of reducing dependence on a single crop, and will, no doubt, diminish future price and production risks for southern farming to some extent.

7. One interesting development during the World War II boom has been the apparent awareness of both borrowers and lenders of dangers in overborrowing. This was particularly noticeable in the Great Plains, where substantial reductions in mortgage debt occurred (see Tables 3 and 4, in Introduction). Certainly reduced mortgage debts do not affect the likelihood of production failures or price declines in the future, nor do they relieve farmers from the necessity of going in debt in case of future difficulties; but the existence of a moderate debt structure does increase the ability of agriculture to withstand future hardships that are almost certain to develop. It remains to be seen, of course, whether the awareness of borrowers and lenders of the dangers in overexpansion of credit is temporary or permanent.

8. Recognition of the fact that mortgage default is often the result of failure to adjust mortgage terms to probable repayment ability, or of broad economic or climatic forces over which the individual farmer has no control, has resulted in institutional arrangements intended to reduce the probability of legal

default and to temper the consequences of such default. Farm mortgages in increasing proportion are being written on a long-term amortized basis with instalments better adjusted to the probable flow of farm income available for debt service charges. Many mortgages carry provisions for deferment of payments if the farmer, through no fault of his own, is unable to meet them. Some mortgages provide for variable payments directly geared to fluctuations in farm income. During the thirties the federal government refinanced large numbers of distressed farm mortgages, and provision undoubtedly will again be made for refinancing operations of that kind in the event of another major depression or widespread crop failures. Most states passed moratorium legislation during the thirties, and in a few instances deficiency judgments were outlawed or restricted as to terms. Legislation providing for the insurance of farm mortgages has been passed, but has not been used extensively so far. Mortgage insurance would no doubt reduce the lender's risk: whether it would reduce the borrower's is another question.

These and other adjustments will naturally be expected to exert a considerable influence on the incidence of farm mortgage distress in the future. Possibly they will tend to reduce the general severity of distress, as is hoped, and probably they will alter the geographical pattern of distress that characterized the interwar period. But the amount of reduction and the extent of the alteration are necessarily uncertain. It is relatively easy, in reviewing the past, to point out most of the forces that have contributed to heavy foreclosures and losses, and the counteractive adjustments that have developed. But it is less easy to determine whether the same forces are still operative, and it is extremely difficult to ascertain the effectiveness of the adjustments—especially since many of them have not yet been tested in the fire of a severe agricultural depression.

Continuing Problems

It is obvious that, in the last analysis, farm mortgages default and are foreclosed because farm incomes fail to achieve expectations. A review of farm mortgage loan experience in the United States during the interwar period indicates many causes for mortgage distress, which have one common characteristic. In one way or another they all contribute to the instability and uncertainty of farm incomes, so that prospective buyers, borrowers, and lenders are unable to make accurate forecasts.

It is clear that the central problem of farm mortgage lending has been and continues to be the forecasting of future trends of agricultural prices and incomes. Although production failures, notably in the Great Plains, have contributed greatly to farm mortgage difficulties, nevertheless the widespread financial distress in agriculture during the interwar period was primarily the result of failure to anticipate the extent of price declines from previously existing levels.

In addition to the problem of forecasting the long-term agricultural outlook, farm lenders are confronted with the uncertainties created by rapid technological change in an industry with millions of small producing units, no two of which are exactly alike and no two of which are affected in precisely the same manner by new developments. This situation greatly complicates the problem of obtaining accurate appraisals, on either a market value or a capitalized earnings basis. There is every reason to believe that the twin problems of making accurate appraisals and adjusting loans to repayment ability will continue to be difficult in the future, even if less difficult than in the past.

APPENDIX A

AN ANALYSIS OF MORTGAGE EXPERIENCE STUDIES

Illustrations of Method

THE first comprehensive statistical analyses of farm mortgage experience were those made around 1930 by F. F. Hill and by E. C. Johnson, covering federal land bank loans in the Northeast and in Minnesota, respectively.[1] Since that time five similar studies have been published by various agricultural experiment stations, several of them done with the cooperation of federal land banks, and two studies have been presented as doctoral dissertations.

To illustrate Hill's approach, Table A-1 shows, for 9,153 federal land bank loans in New York state, the relation between foreclosure experience and the value per acre of the mortgaged land. Two indices of foreclosure experience are given: the percentage of foreclosures on loans secured by farms in each land-value class, and the rate of loss for each class of loans. Although both indices show worse than average experience for the low-valued land, and vice versa, they do not imply precisely the same thing. The foreclosure rates measure the ability of farms in the several land-value classes to avoid financial difficulty during the period under review; they imply that low-valued land, presumably poor land, is a cause of farm mortgage distress, and that the appraised value of land can be used to predict the success of a mortgage. The loss rates, on the other hand, measure financial risk to the lender and are therefore of particular interest for lenders wishing to calculate differential reserve requirements for loans secured by farms differing in value, or to determine how much allowance should be made for the loss factor in calculating lending costs.

In general, losses tend to be high when foreclosures are high, but the correspondence is far from perfect. Table A-1, for example, shows that farms on land valued at less than $30 an acre had 7.2 percent foreclosures, which was only 1.7 times as great as the average; but these same farms had losses of $27.39 per thousand dollars loaned, which was four times the average. Consequently, a statistical study of mortgage experience must include loss rates as well as foreclosure rates if it is to be of the greatest possible value to lenders in formulating loan policy. Seven of the nine studies reviewed here include both loss rates and foreclosure rates.

[1] F. F. Hill, *An Analysis of the Loaning Operations of the Federal Land Bank of Springfield from Its Organization in March, 1917, to May 31, 1929* (Cornell University Agricultural Experiment Station, Bulletin 549, December 1932); E. C. Johnson, *Farm Mortgage Foreclosures in Minnesota* (University of Minnesota Agricultural Experiment Station, Bulletin 293, 1932).

TABLE A-1

Relation of Appraised Value per Acre to Land Bank Loan Experience in New York State, 1917-29

Appraised value of farm per acre	*Number of loans made*	*Loans foreclosed*		*Net loss on foreclosed farms per $1,000 loaned*
		Number	Percentage	
Less than $30	1,243	89	7.2%	$27.39
$30-59	3,604	169	4.7	7.79
$60-99	2,411	70	2.9	
$100-199	1,444	45	3.1	3.54
$200 and over	451	8	1.8	
All land-value classes	9,153	381	4.2%	$6.84

From *An Analysis of the Loaning Operations of the Federal Land Bank of Springfield from Its Organization in March, 1917, to May 31, 1929*, by F. F. Hill (Cornell University Agricultural Experiment Station, Bulletin 549, December 1932), Tables 14 and 15, pages 25 f.

Table A-2, taken from E. C. Johnson's Minnesota study, presents a statistical technique alternative to that in Table A-1. It uses two separate percentage distributions of farmer-borrowers according to age, one for the good loans and one for the foreclosed loans. Since the foreclosed group contains relatively more young farmers than the good loan group, it can be concluded that the younger farmers are probably poorer risks than the older farmers. A rough calculation of the average age of borrowers for the two groups gives 43.9 years for the foreclosed loans and 46.0 years for the good loans. The method of analysis illustrated here is less straightforward than the method of Table A-1, for it shows foreclosure rates only indirectly and does not so much as imply loss rates. However, it has the advantage of saving clerical labor, since it often permits a reduction in the number of loans studied. Instead of analyzing a lender's entire portfolio, one can take all the foreclosed loans and an equal, or nearly equal, control sample of good loans.

Table A-3 summarizes the results of nine mortgage experience studies. Although insufficient to provide a comprehensive picture of foreclosures in the United States, together they cover a variety of geographical areas and types of farming, from potatoes in eastern Maine to grain and livestock in Montana. They give a good deal of information on foreclosure experience and serve to illustrate the kind of results obtainable by the methods described above. All told, twenty-three factors affecting credit experience have been listed, which we group, for the sake of convenience, in five broad

TABLE A-2

Percentage Distribution of Land Bank Loans in Minnesota by Age of Borrower

Age of borrower	*Foreclosed loans*	*Good loans*
30 yrs. and under	14.3%	8.4%
31-40	26.4	25.6
41-50	27.8	29.6
51-60	20.6	22.8
61-70	9.6	11.6
70 and over	1.3	2.0
Total	100.0%	100.0%

From *Farm Mortgage Foreclosures in Minnesota*, by E. C. Johnson (University of Minnesota Agricultural Experiment Station, Bulletin 293, 1932), Table 15, page 15.

categories as follows: (1) Physical characteristics of the farm. (2) Physical characteristics of buildings and equipment. (3) Personal characteristics of the borrower. (4) Farm organization. (5) Financial characteristics of the loan.

Physical Characteristics of the Farm

The purely physical characteristics analyzed by mortgage experience studies include soil type, elevation, and topography. All these factors would be taken into account by a competent appraiser and by most prospective purchasers. Yet the real importance of physical attributes lies in their economic manifestations. Under existing farm technology, certain combinations of soil, climate, and topography are particularly well adapted to efficient agricultural production; they therefore earn a higher return than the less favorable combinations, and they usually command a higher market price.

At the present time considerable efforts are being made, both by lenders and by agricultural economists, to classify and map land according to its economic value, or income earning capacity. Several systems of economic classification are now in use, including the "land class" system used by a number of the eastern land grant colleges, and the "net income area" system used by one or two western states and some of the federal land banks. In most of them the actual mapping process is based on two very different types of evidence: tangible manifestations of prosperity, and correlative information on physical productivity. The manifestations of prosperity are usually obtained from a roadside survey covering the general appearance of private buildings and equipment, the num-

TABLE A-3

Findings of Nine Mortgage Experience Studies Summarized

Code: XX, strong, definite findings; X, definite findings; C, definite findings contradicting those of other studies; O, findings negative or uncertain

Factors	*A. G. Nelson: Iowa loans*	*F. F. Hill: Springfield land bank loans*	*Ackerman & Norton: Illinois loans*	*C. H. Mereness: Alabama loans*
Characteristics of farm				
Soil	....	....	XX	XX
Elevation	....	X	....	....
Topography	....	....	X	X
Yield per acre	....	....	O	X
Appraised value per acre	....	XX	[a]	[a]
Land class or net income	XX	....	....	....
Transportation facilities and utilities	....	X	X	....
Characteristics of buildings & equipment				
Value of house	....	XX	O	....
Value of barn	....	O	....	....
Value of all buildings	....	X	O	....
Value of machinery	....	....	....	....
Personal Characteristics				
Age	....	O	O	....
Experience	....	X	O	....
Farm organization				
Type of farming	....	....	O	....
Number of hens	....	X	X	....
Number of cows	....	....	O	....
Total acres in farm	....	X	X	XX
Productivity values	....	....	....	....
Financial factors				
Amount of loan	....	....	....	....
Loan-to-value ratio	XX	X	XX	XX
Amount of loan per acre	O	....	....	C
Method of acquiring farm	....	O	O	....
Time when loan was made	....	X	XX	....

(continued on next page)

TABLE A-3 (continued)

Code: XX, strong, definite findings; X, definite findings; C, definite findings contradicting those of other studies; O, findings negative or uncertain

Factors	*S. W. Warren: New York state loans*	*C. Merchant: Aroostook county, Me. loans*	*Eckert & Maughan: Montana loans*
Characteristics of farm			
Soil	XX	....	XX
Elevation	X	....	....
Topography	....	....	....
Yield per acre	....	....	XX
Appraised value per acre	....	XX	....
Land class or net income	....	....	....
Transportation facilities and utilities	X	X	....
Characteristics of buildings & equipment			
Value of house	X	....	....
Value of barn	X	....	....
Value of all buildings	....	X	XX
Value of machinery	....	....	....
Personal characteristics			
Age	O	O	....
Experience	....	X	....
Farm organization			
Type of farming	....	....	X
Number of hens	....	....	....
Number of cows	....	....	....
Total acres in farm	....	....	C
Productivity values	....	....	XX
Financial factors			
Amount of loan	X	....	....
Loan-to-value ratio	....	....	X
Amount of loan per acre	O	....	X
Method of acquiring farm	....	O	....
Time when loan was made	X[b]	....	X

(concluded on next page)

TABLE A-3 (concluded)

Code: XX, strong, definite findings; X, definite findings; C, definite findings contradicting those of other studies; O, findings negative or uncertain

Factors	*E. C. Johnson: Minn. loans*	*K. O. Hanson: W. Wash. loans*	*Remarks*
Characteristics of farm			
Soil	X	....	Good soils produce good loans
Elevation	....	....	Usually related to soil type
Topography	....	....	Usually related to soil type
Yield per acre	....	....	
Appraised value per acre	O	....	Reflects differences in soils and other physical productivity factors
Land class or net income	....	XX	
Transportation facilities and utilities	....	....	
Characteristics of buildings & equipment			
Value of house	X	....	Good house usually a good sign
Value of barn	....	....	Good barn on poor land a bad sign
Value of all buildings	X	....	
Value of machinery	X	....	
Personal characteristics			
Age	X	....	Older borrowers slightly better
Experience	....	....	
Farm organization			
Type of farming	....	XX	
Number of hens	....	....	
Number of cows	X[c]	....	
Total acres in farm	X	XX	Large farms usually have poor experience
Productivity values	....	....	
Financial factors			
Amount of loan	....	....	
Loan-to-value ratio	X	XX	
Amount of loan per acre	X	....	
Method of acquiring farm	....	....	
Time when loan was made	X	....	Loans made around 1920 had high foreclosure rates

A bibliographical listing of the studies is given in footnote 1, page 135.

[a] When loans were broken down by soil type, appraised value was not important within type classifications.

[b] In southern New York loans made in 1917-21 had high foreclosure rates; in western New York they had low rates.

[c] Includes all livestock.

ber and quality of public buildings such as schools and churches, the quality of roads, and the availability of public utilities and services. All these furnish useful indications of farm earning power within the area. The indications are then checked against available evidence of physical productivity, such as soil maps and crop yields. In short, classifications by land class or net income area reflect a long list of factors—including the purely physical attributes determining farm productivity.

Naturally, appreciable differences may be found among the various systems of land classification. Chapter 6 mentioned two systems used in western Washington. The net income area system, used by the Federal Land Bank of Spokane, takes account of sources of off-farm income, which are important to part-time farmers. On the other hand, the economic land use system, used by the State College of Washington and the State Department of Conservation and Development, covers only income from farming operations. Thus the two systems give quite different indications in areas that are not well adapted to full-time farming but have good employment opportunities for part-time farmers. Table A-4, adapted from Hanson's material, shows that foreclosure experience varies greatly within economic land use classes when farms in those classes are broken down by net income area as well.

Land class maps were not available to those who made the first mortgage experience studies. These pioneers either used appraised value as a rough substitute or obtained information on the strictly physical characteristics of the farms surveyed. Hill's tabulation of loans by appraised value (Table A-1) has already been presented. An example of a breakdown according to physical soil type, by Mereness, is presented in Table A-5. There is a marked variation in foreclosure rates, and an even greater variation in loss rates. Furthermore, the soils with the best experience are almost invariably the more highly valued.

Farm topography is sometimes a key factor affecting productivity. If the terrain is sufficiently rough, it will discourage and perhaps even prevent the use of efficient farm machinery. In addition, rough terrain is more susceptible to erosion than level or slightly rolling terrain. Thus topography is often related to soil quality, especially in areas that have been farmed for many years. Ackerman and Norton, who analyzed this factor, found that loans on level farms in Illinois had better experience than loans on rough or rolling farms.[2]

Elevation is frequently associated with soil quality as well as with length of growing season, topography, and accessibility to

[2] Joseph Ackerman and L. J. Norton, *Factors Affecting Success of Farm Loans* (University of Illinois Agricultural Experiment Station, Bulletin 468, August 1940), Table 6, p. 471.

TABLE A-4

Land Bank Loan Experience in Western Washington, by Net Income Area within Economic Land Use Class

Economic land use class and net income area	*Number of loans made*	*Number of acquisitions as a percentage of loans made*	*Loss per $1,000 loaned*[a]	*Cultivated acres per farm*	*Percentage of land cultivated*
Land use class 1					
Income area 1	128	2%	$+3	60	84%
Land use class 2					
Income area 1	57	0	0	36	67
Income area 2	672	6	15	37	64
Land use class 3					
Income area 2	86	2	+10	22	60
Income area 3	1,835	10	32	26	47
Land use class 4					
Income area 3	1,083	8	22	15	41
Income area 4	1,189	18	84	22	34
Land use class 5					
Income area 3	212	7	17	9	36
Income area 4	851	17	81	14	28
Income area 5	332	30	157	19	22
Land use class 6					
Income area 5	9	33	317	15	14

Adapted from *Federal Land Bank Loan Operations in Western Washington, 1917-49*, by Kermit O. Hanson (Iowa State College, unpublished Ph.D. thesis, 1950), Table 8, page 32.

[a] Plus denotes gains.

markets. Warren found in his study of loan experience in southern New York that the percentage of foreclosures increased with elevation (Table A-6).

Since good transportation facilities, such as hard roads and a nearby central shipping point, contribute to farm efficiency, it is natural to suppose that such factors would be related to foreclosure experience. The four studies that covered transportation factors—Hill's, Warren's, Ackerman and Norton's, and Merchant's—did show an appreciable relation. Hill, for example, found a foreclosure rate of 1.9 percent for farms on improved roads in contrast to 4.5 percent for farms on unimproved roads more than two miles from the shipping point, which rates compared with an over-all rate of 3.3 percent for all farms.[3] In Aroostook county, Merchant found, land bank loans on farms two miles or less from a shipping point had a foreclosure rate of 10.6 percent, in contrast with 24.4

[3] Hill, *op.cit.*, Table 58, p. 58.

TABLE A-5

Relation of Type of Soil to Loan Experience and Other Factors, Southeastern Alabama, 1917-31

Type of soil	*Number of loans made*	*Appraised value per acre*	*Average loan per acre*	*Loss per $1,000 loaned*	*Percentage of loans foreclosed*
Norfolk sandy loam and fine sandy loam	1,306	$52	$19	$19	6%
Norfolk gravelly sand	43	45	17	32	7[a]
Greenville sandy loam	356	58	22	17	8
Ruston sandy loam	292	54	19	29	8
Greenville loamy sand	283	52	20	20	11
Orangeburg sand and fine sand	139	35	12	33	11
Ruston loamy sand	57	42	15	30	12
Orangeburg sandy loam and fine sandy loam	271	39	14	30	13
Norfolk fine sand	89	32	12	49	15
Norfolk loamy sand	144	47	17	67	18
Kalmia, Leaf, Myatt, Cahaba and Congaree fine sandy loams	132	31	11	114	26
Norfolk sand	684	33	12	102	27
Kalmia sand	58	33	12	148	33
Susquehanna fine sandy loam	303	30	11	152	34
Kalmia fine sand	88	29	10	218	47
All soil types[b]	4,750	$42	$15	$54	15%

From *Farm Mortgage Loan Experience in Southeast Alabama*, by E. H. Mereness (Alabama Polytechnic Institute Agricultural Experiment Station, Bulletin 242, January 1935), Table 1, page 4.

[a] Probably this soil type is not as good as the figure would indicate; the number of farms included may be too small to be representative.

[b] Includes mixed and unclassified soil types in addition to the listed types.

TABLE A-6

Relation of Elevation to Foreclosure Experience and Other Factors, Southern New York, 1917-29

Elevation above sea level (feet)	*Number of loans made*	*Average loan*	*Average acreage per farm*	*Percentage of loans foreclosed*
Less than 1,300	687	$3,540	132	18%
1,300-1,499	397	2,610	141	19
1,500-1,699	292	2,357	155	34
1,700 and over	84	2,371	183	42

From *Results of Farm-Mortgage Financing in Eleven Counties in New York State*, by S. W. Warren (Cornell University Agricultural Experiment Station, Bulletin 726, December 1939), Table 22, page 18.

percent for loans on farms more than eight miles from a shipping point.[4] But the significance of the findings on transportation is beclouded by the fact that land favorable to the construction of roads and railways—because of level terrain, good drainage, and the like—is usually also favorable to farming. Moreover, there is a question of cause and effect. Good roads are frequently built past good farms because such farms are capable of paying higher taxes; and shipping points may be located in the most prosperous areas because these promise better business.

Buildings and Equipment

It is well known that the character and condition of farm buildings and equipment in an area usually reflect the basic productivity of the land. In fact, much of the economic classification of land (such as the mapping of land classes or net income areas) relies heavily upon a roadside appraisal of buildings, equipment, and other tangible evidence of prosperity. To an extent, of course, good buildings and equipment, like good land, actually contribute to farm income and debt paying ability, provided they are properly adapted to the size and type of the farm enterprise. Equipping a farm is a problem in the proper proportioning of productive factors. Too little equipment, or the wrong kind, results in physical inefficiency and ineffective use of labor; too much equipment, however, may result in financial inefficiency because it imposes maintenance burdens and capital costs that are not compensated by increased physical efficiency.

Five of the studies reviewed here obtained information on the combined value of all farm buildings, and four of them showed a significant tendency for foreclosure rates to be high for farms with low-valued buildings. In the fifth study, by Ackerman and Norton, the relationship did not appear significant. Concerning specific items of buildings and equipment, the most definite evidence, obtained by Hill, refers to the appraised value of farmhouses in the Springfield land bank district. It brings out two important points: first, that the good houses tend to be located on the good land; and second, that on land of similar quality, loans on farms with good houses are foreclosed less frequently than the loans on farms with poor houses (Table A-7), and the losses entailed are smaller. Since the farmhouse is largely a consumption good, it does not contribute directly to the productivity of the farm, but it definitely reflects farm earning power. A poor farm will not support a fine, comfortable house. The residence value of the house, moreover, does add considerably to the market value of the property—par-

[4] Charles H. Merchant, *Farm Credit in Aroostook County, Maine* (University of Maine Agricultural Experiment Station, Bulletin 418, April 1943), Table 52, p. 372.

ticularly in thickly settled areas within commuting distance of cities. In case of default and foreclosure, a farm with a good house can often be sold or rented as a country home. Finally, the better the farmhouse, the more likely it is that a farmer who cannot farm his land profitably will continue living on his farm even though he shifts to nonfarm employment.

Ackerman and Norton's study of Illinois farm loan experience tends to confirm Hill's findings. It shows clearly that the good houses are more often located on the good farms. It also shows perceptibly smaller foreclosure rates and loss rates for farms with good houses, but the tendency is not pronounced, as it was in Hill's observations, and the significance of the statistical relationship is questionable.

TABLE A-7

Relation of Appraised Value of Farm Residence and Appraised Value of Tillage Land to Land Bank Foreclosure Experience in the Northeast, 1917-29

Appraised value of farm residence	*Appraised value per acre of tillage land*	
	Less than $55	$55 and over
Less than $2,500		
Number of loans made	6,414	4,934
Percentage of loans foreclosed	5.2%	3.0%
$2,500 and over		
Number of loans made	1,984	6,592
Percentage of loans foreclosed	3.1%	1.9%

From *An Analysis of the Loaning Operations of the Federal Land Bank of Springfield from Its Organization in March, 1917, to May 31, 1929*, by F. F. Hill (Cornell University Agricultural Experiment Station, Bulletin 549, December 1932), Table 77, page 76. The data cover loans made by the Springfield land bank in New England, New York, New Jersey, and Pennsylvania.

Farm equipment was analyzed only in the study of Minnesota loans by E. C. Johnson. He found that farms with comparatively small investment in machinery accounted for a greater proportion of the foreclosed loans than of the unforeclosed.

Evidence that good buildings may sometimes be associated with poor mortgage experience was presented by Warren, who analyzed the value of barns in New York. He says:

"In land classes I and II in southern New York, an average loan of $1020 was made on farms where the barn was valued at less than

$500. Fifteen per cent of these loans were foreclosed. On farms where the barn was valued at $2500 or more, an average of $3306 was loaned, and half of these loans were foreclosed. On land which is not adapted to agriculture, a good barn does not indicate a high debt-paying capacity.

"In land class III in southern New York, where the barn was valued at less than $1500, an average of $1992 was loaned, and 16 per cent of these loans were foreclosed. Where the barn was valued at $3500 or more, an average of $5012 was loaned, and 14 per cent of the loans were foreclosed. On land which has agricultural value, a good barn usually indicates a higher debt-paying capacity."[5]

Although we doubt whether the differences in foreclosure rates observed in land class III are significant, the variations in land classes I and II appear to be important. They definitely suggest that a high-priced barn on poor land represents an unbalanced combination of productive factors, and perhaps an unnecessary financial burden.

Personal Characteristics of Borrower

Lenders generally agree that a good farmer, as well as a good farm, is essential to a good loan. Good technical management is required to obtain the highest physical productivity from a farm. It is particularly important wherever there is an erosion hazard, for a few years of carelessness may result in impaired earnings and reduced collateral value. Financial acumen and attitude toward obligations are also important. Some lenders even stress the importance of investigating the family situation. Are domestic relations harmonious? Are the wife and children contented? If not, the family may break up or move to the city.

The importance of personal characteristics must be accepted largely on faith because of the difficulties of objective measurement. How is one to measure a farmer's managerial ability, his integrity, his industry, or the stability of his family relations?[6] Of the few

[5] S. W. Warren, *Results of Farm-Mortgage Financing in Eleven Counties in New York State* (Cornell University Agricultural Experiment Station, Bulletin 726, December 1939), pp. 19 f.

[6] There are two possible approaches to the measurement of managerial ability. The first is by means of the past performance record. That is the method of business loan analysis. It requires detailed records of earnings and operations going back over a period of years. These are seldom available in the agricultural field, and they are never available for the young farmer just starting out. One of the drawbacks of the method is that it does not really measure ability. A good earnings record implies a combination of a good farm and good management. But it does not separate the effect of good management from good soil, good equipment, and good location. The second approach is the psychological aptitude test. Although used extensively in industrial personnel placement, it is seldom used in agriculture. Whatever the possibilities in such testing—and they may be considerable—it is clearly a job for the psychologist.

personal characteristics analyzed statistically, none has been a good measure of farming ability, and none has shown a close relation to foreclosures. For example, tabulations of borrowers' ages have shown very little variation in foreclosure rates. Table A-2, which is from Johnson's study, implied slightly better experience for older borrowers. Federal land bank loans in Aroostook county, Maine, showed a slight superiority for borrowers over 65. Hill's study, on the other hand, showed a slight superiority for borrowers between 40 and 60. Ackerman and Norton found no variation great enough to be considered statistically significant. Moreover, all the foregoing results have probably been affected by the fact that borrowers' ages are almost certainly related to the year in which their farms were purchased. Thus, if a wave of young farmers bought farms during the inflation of the World War I period, one would expect to find a wave of middle-aged farmers having mortgage difficulties during the thirties.

Analysis of borrowers' previous farming experience was somewhat more conclusive than the analyses of borrowers' ages. On land bank loans in Aroostook county there were 19.0 percent foreclosures for inexperienced farmers in contrast with 12.9 percent for the more experienced. Hill's study showed a similar relationship for farms valued at $60 or less per acre but no significant difference for higher-valued farms (Table A-8). Inexperience, coupled with low-valued land—presumably of low productivity—resulted in a high percentage of failures. On the more productive land previous farming experience in the area studied did not appear to be important.

Farm Organization

Two closely related subjects come under the heading of farm organization: type of farming and size of farm. Both depend largely on soil, climate, transportation facilities, available markets, and so on. As was shown in Part I, the Great Plains are generally best suited to ranching or extensive wheat farming, either of which requires large acreages. In the South, on the other hand, social organization and limited capital have forced many farmers to farm small acreages with a labor-intensive crop, cotton.

Within broad regions there are also local variations in type of farming and size of farm that may affect foreclosure experience. These are most common in areas where soils and topography are not uniform. In central New York, for example, farmers in hilly country tend to specialize in an extensive type of dairy farming, while farmers in the valleys frequently combine intensive dairying with the production of intensive cash crops. But even where soil and other physical conditions are relatively uniform, personal desires, family needs, or limitations of capital may result in considerable differences in type and size of farm. A farmer with four sons,

TABLE A-8

Relation of Farming Experience of Borrower and Appraised Value per Acre to Land Bank Foreclosure Experience in the Northeast, 1917-29

Previous farming experience of borrower[a]	*Appraised value of farm per acre*		All farms
	Less than $60	$60 and over	
No recent farming experience in the Northeast			
Number of loans made	2,093	2,010	4,103
Percentage of loans foreclosed	7.5%	2.2%	4.9%
Recent farming experience in the Northeast			
Number of loans made	8,044	7,774	15,818
Percentage of loans foreclosed	3.9%	2.0%	3.0%
All borrowers			
Number of loans made	10,137	9,784	19,921
Percentage of loans foreclosed	4.6%	2.1%	3.4%

From *An Analysis of the Loaning Operations of the Federal Land Bank of Springfield from Its Organization in March, 1917, to May 31, 1929*, by F. F. Hill (Cornell University Agricultural Experiment Station, Bulletin 549, December 1932), Table 78, page 77. The data cover loans made by the Springfield land bank in New England, New York, New Jersey, and Pennsylvania.

[a] All persons who had had five years or more of farming experience in the Northeast immediately before the time the loan was made were classified as experienced farmers. All other borrowers were classified as inexperienced farmers.

for example, may choose intensive dairying and cash crops as the most suitable enterprises; another farmer, with two daughters, might farm the same land more extensively, producing diversified field crops that have smaller labor requirements.

The interrelationships between type of farming and size of farm, or between either of these and soil quality, make the interpretation of statistics on farm organization exceedingly difficult. A tabulation of farms by number of cows, for example, might reflect either size or type. In a predominantly dairy area, it would reflect mainly size; in a mixed farming area it would also reflect type. A farm with twelve cows might be either a small dairy farm or a large general farm where milk production is only a side line.

A simple tabulation of the number of foreclosures among farms

in different acreage groups may conceal significant relationships. When F. F. Hill found that farms of less than twenty acres had the lowest foreclosure rate among seven size groups studied—no foreclosures among 549 loans—he concluded that some factor other than mere acreage might be responsible. The fact that small full-time farms usually have small mortgages, interest on which can be paid, if necessary, from outside sources of income, did not seem quite adequate to explain their avoidance of foreclosures. A second explanation is that in the Northeast people often purchase small rural properties for suburban homes, which they sometimes operate as part-time farms. Most such properties would probably be classified as farms by the census, though they have many of the characteristics of residential real estate. A third possible explanation of the favorable experience on very small farms is that many of them were poultry farms, which can be operated successfully on small acreages, on either a part-time or full-time basis. Poultry farming was quite profitable in the Northeast during much of the period under review, and Hill's findings showed only 1.3 percent foreclosures for farms with 500 hens or more as against 3.5 percent for other farms.[7]

Hanson's findings concerning small, part-time farms in western Washington have already been mentioned.[8] In brief, certain parts of the territory seem much better adapted to part-time than to full-time farming, and the evidence clearly indicates that there the smallest farms—apparently part-time enterprises for the most part—had the best foreclosure experience.

Further evidence of good experience on small farms, found by Mereness, is presented in Table A-9. Here, some explanation is offered by the columns giving percentage of farm in crop land and amount of loan per acre, both of which decrease as acreage increases. The figures certainly imply that the small farms in southeast Alabama were being operated much more intensively than the large farms, and they may also imply that the small farms were located on generally better land, which would naturally facilitate intensive cultivation.

One single contradictory example, showing poor loan experience for small farms, was presented by Eckert and Maughan in their study of wheat farming in central Montana (Table A-10). There, however, the small farms had, on the whole, proportionally less good land than the large farms—just the opposite of what Mereness found in Alabama. Moreover, the proportion of loans made during the inflated war period, 1917-21, was higher for small farms than for others.

Eckert and Maughan also tabulated central Montana farms ac-

[7] Hill, *op.cit.*, pp. 43 f.

[8] See pages 138 f., 205, and 206.

cording to "productivity value" per farm. According to them, the productivity value of a farm is a measure of both size and soil quality. They say:

"Probably the best measure of the worth of a farm is its capitalized normal income producing ability. If the income from a farm over a number of years is known, one method of arriving at the value of the farm would be by capitalizing this return at a fair rate of interest. The value arrived at by this method has been called the productivity value. . . . In twenty-five counties of Montana, including the area used in this study, it is possible to rather accurately estimate the normal production of farms by reference to the amount of the various grades of farm and grazing land on each farm. From the analysis of land values given in Bulletin 348 of the Montana Agricultural Experiment Station, the productivity values (per acre) of the different grades of farm and grazing lands in Montana are as given below:

	Farm land	*Grazing land*
First grade	$35.00	$3.00
Second grade	18.00	2.50
Third grade	3.00	1.50
Fourth grade	1.50	1.00
Fifth grade	....	.75

"Since yields and carrying capacity have been determined for the various grades of farm and of grazing land it is evident that productivity value (per farm) is a combined measure of the size of farm and of the quality of land."[9]

However, the productivity value may also be interpreted as a measure of capital—not so much capital actually invested as present going-concern value. As such, the productivity value measures size in the financial sense rather than in the purely physical sense. Possibly that is a better measure of size. Table A-11 shows variations in the loan experience of wheat farms according to productivity value. The results are hardly surprising.

For the most part, tabulations by type of farming have shown little variation in mortgage experience. A notable exception, however, was presented by Hanson and is reproduced in Table A-12. Here, the poor experience on tree fruits is clearly due to low prices and other contributing factors discussed in Chapter 5.[10] The good experience on poultry farms recalls Hill's findings for the Northeast, where farms with 500 hens or more had better experience than others.

[9] Phil S. Eckert and Orlo H. Maughan, *Farm Mortgage Loan Experience in Central Montana* (Montana State College Agricultural Experiment Station, Bulletin 372, June 1939), pp. 25 f.

[10] See page 129.

TABLE A-9

Relation of Size of Farm to Loan Experience and Other Factors, Southeastern Alabama, 1917-31

Acres per farm	*Average percentage of farm in crop land*	*Average loan per acre*	*Percentage of loans foreclosed*	*Loss per $1,000 loaned*
1-19	91%	$31	0%	$0
20-59	79	20	5	9
60-99	72	18	9	20
100-139	66	17	14	28
140-219	62	16	19	48
220-299	60	15	21	54
300-459	57	14	30	85
460-779	51	14	28	86
780-1,319	48	11	39	129
1,320-2,639	43	8	23	102
Average	61%	$15	15%	$54

From *Farm Mortgage Loan Experience in Southeast Alabama*, by E. H. Mereness (Alabama Polytechnic Institute Agricultural Experiment Station, Bulletin 242, January 1935), Table 12, page 13. The data cover 4,750 loans.

TABLE A-10

Relation of Acreage Cultivated to Foreclosure Experience on Central Montana Wheat Farms, 1911-32

Acres cultivated, 1928-32	*Number of loans made*	*Percentage of loans*		
		Made during 1917-21	Made on 1st & 2nd grade land	Foreclosed
Less than 200	115	43%	34%	59%
200-399	115	27	52	32
400-599	55	31	45	31
600-799	33	39	45	42
800-999	20	25	40	25
1,000 or more	25	24	52	16

From *Farm Mortgage Loan Experience in Central Montana*, by Phil S. Eckert and Orlo H. Maughan (Montana State College Agricultural Experiment Station, Bulletin 372, June 1939), Table 18, page 25.

TABLE A-11

Relation of Productivity Value per Farm to Loan Experience on Central Montana Wheat Farms, 1911-32

Productivity value per farm	*Number of loans made*	*Percentage of loans foreclosed*	*Loss per $100 loaned*[a]
Less than $1,000	174	63%	$.10.08
$1,000-2,999	102	44	15.24
$3,000-4,999	41	34	11.09
$5,000-9,999	50	27	11.36
$10,000-19,999	48	10	.74
$20,000 or more	15	20	.39

From *Farm Mortgage Loan Experience in Central Montana*, by Phil S. Eckert and Orlo H. Maughan (Montana State College Agricultural Experiment Station, Bulletin 372, June 1939), Table 20, page 26.

[a] Excludes a few loans for which data were not available.

TABLE A-12

Loan Experience by Type of Farming, Western Washington, 1917-32

Type of farming	*Number of loans made*	*Average amount of loan*	*Foreclosure rate*	*Loss per $1000 loaned*
Poultry	628	$1,728	7%	$15
Truck and berries	474	1,834	10	26
Dairy	2,930	3,242	11	36
General	3,513	2,098	14	50
Tree fruits	256	2,931	20	93
All types	7,801	$2,496	12%	$42

From *Federal Land Bank Loan Operations in Western Washington, 1917-49*, by Kermit O. Hanson (Iowa State College, unpublished Ph.D. thesis, 1950), Table 18, page 40.

Financial Characteristics

This section is concerned with debt load and its relation to land values. The specific factors considered are the amount loaned, the ratio of that amount to the appraised value of the farm, the amount of loan per acre, the year in which the loan was made, and the manner in which the farm was acquired by borrower.

As a measure of debt load, the amount loaned is probably in-

ferior to the ratio of loan amount to appraised value, the amount of loan per acre, or any one of several ratios relating loan carrying charges to farm income. The one study that analyzed size of loan, Warren's, indicated that foreclosure experience was much worse for large loans than for small ones.

The ratio of loan amount to appraised value has already been discussed in Chapter 6. Mortgage experience studies have repeatedly shown that both foreclosures and losses tend to be high when loans are large in relation to value. Moreover, a few cross-tabulations of loans by loan-to-value ratio and soil type have indicated that farms

TABLE A-13

Relation of Borrower's Equity in Real Estate to Loan Experience in Southeastern Alabama, 1917-31, by Soil Class of Farm

Borrower's equity as percentage of appraised value of farm[a]	*Percentage of loans foreclosed*			*Loss per $1,000 loaned*		
	Sandy loam soils	Other soils	All soil classes	Sandy loam soils	Other soils	All soil classes
80-99%	0%	7%	2%	$0	$2[b]	$1[b]
70-79%	3	11	7	2	21	9
60-69%	6	20	12	10	68	35
50-59%	11	29	19	34	115	68
30-49%	10	39	23	17	146	70
0-29%	16	44	30	42	222	131
Less than 0	19	62	43	111	176	143
Average	8%	25%	15%	$21	$99	$54

From *Farm Mortgage Loan Experience in Southeast Alabama*, by E. H. Mereness (Alabama Polytechnic Institute Agricultural Experiment Station, Bulletin 242, January 1935), Table 15, page 15. The data cover 4,712 loans.

[a] Borrower's equity is the equity above all liens at the time the loan was made, including the first mortgage.

[b] Gain.

on good land appear capable of carrying much larger loans in relation to value than farms on poor land; that is, the safe debt ratio is higher for good land than for poor land. As an example, Table A-13 shows, for specified debt loads, differences in mortgage experience between the productive sandy loam soils and other soils in southeastern Alabama.[11]

[11] What the table actually gives is the ratio of borrower's equity to the appraised value, rather than the loan-to-value ratio. This is the equity above all liens, including the first mortgage. Hence, if the equity is 60 percent of appraised value, all loans must constitute 40 percent.

Some lenders have come to accept the principle of differentiating between grades of land in formulating their lending standards; on poor land they do not lend as large a percentage of appraised value as on good land. The land banks are making increasing use of mortgage experience statistics in formulating loan policies for various grades of land. They classify loans according to land class or net income area and then ascertain the relation between debt load and loan experience for each group. As an example, Tables A-14 and A-15, which cover 23,128 loans made by the Federal Land Bank of Spokane, show first foreclosure rates, then loss rates, by debt load and net income area.

Although the qualitative principles illustrated in the two tables are applicable to lending in general, the actual foreclosure and loss rates are representative only of land bank experience in the particular areas. One of the problems encountered in analyzing the loan-to-value ratio in relation to foreclosure experience is that lenders follow different appraisal policies and use different methods. Loan-to-value ratios are, therefore, not strictly comparable among lenders. A 60 percent loan by one lender might be larger in relation to debt carrying capacity than a 75 percent loan by an-

TABLE A-14

Relation of Debt Load to Acquisition Rates on Land Bank Loans Made in 1917-32 in 76 Counties in Washington, Oregon, Idaho, and Montana; by Net Income Area

	Debt load[a]				
Net income area	Light	Medium	Medium heavy	Heavy	Very heavy
	Acquisition rate[b]				
1	0.8%	2.8%	5.5%	[c]	[d]
2	0.2	8.2	9.4	16.4%	0.0%
3	4.2	11.8	21.7	23.8	29.3
4	6.8	23.8	30.4	32.6	46.9
5	13.7	33.6	40.8	54.0	62.8
All areas	3.9%	13.7%	20.7%	28.5%	43.0%

From a special tabulation prepared by Alexander Joss, Director of Research, Farm Credit Administration of Spokane. The data cover 23,128 loans.

[a] Debt loads are calculated as percentages of the normal agricultural value of the farm in 1936-42, and are classified approximately as follows: light, 39 percent or less; medium, 40-65 percent; medium heavy, 66-75 percent; heavy, 76-85 percent; and very heavy, 86 percent and over.

[b] Acquisitions of farm real estate through October 31, 1948 on loans made in 1917-32, as a percentage of the total amount loaned.

[c] Loans totaled less than $1,000.

[d] No loans.

other. Obviously, credit terms must be adjusted to the lender's own appraisal technique, and the lender who wishes to base his credit terms on experience statistics must work up an analysis of his own records for the purpose.

A third measure of debt burden sometimes considered is the amount of loan per acre. It is probably a poor measure because it reflects two other factors—the loan-to-value ratio and the value per acre. The mere knowledge that farm land is carrying a debt of, say,

TABLE A-15

Relation of Debt Load to Loss Rates on Land Bank Loans Made in 1917-32 in 76 Counties in Washington, Oregon, Idaho, and Montana; by Net Income Area

	Debt load[a]				
Net income area	Light	Medium	Medium heavy	Heavy	Very heavy
	Loss per $1,000 loaned[b]				
1	$+5	$2	$2	[c]	[d]
2	5	1	3	$23	0
3	13	26	56	63	$80
4	9	75	117	118	181
5	66	171	222	309	353
All areas	$12	$36	$63	$101	$176

From *Federal Land Bank of Spokane Reserve Report*, October 31, 1948. The data cover 23,128 loans.

[a] Debt loads are calculated as percentages of the normal agricultural value of the farm in 1936-42, and are classified approximately as follows: light, 39 percent or less; medium, 40-65 percent; medium heavy, 66-75 percent; heavy, 76-85 percent; and very heavy, 86 percent and over.

[b] Losses through October 31, 1948 on loans made in 1917-32, as a percentage of the total amount loaned. Plus signs indicate gains.

[c] Loans totaled less than $1,000.

[d] No loans.

$100 an acre provides very little information concerning the real debt burden or the probability of default. On land valued at $400 an acre, a $100 loan would be conservative; on $160 land it might be liberal; and on $75 land it would probably be excessive. It is hardly surprising, therefore, that different investigators obtained contradictory results on loan per acre. Eckert and Maughan, for instance, found somewhat better than average experience on farms with a small loan per acre, whereas Mereness found slightly worse than average experience.

The debt load that a farm is capable of supporting depends upon fluctuations in farm prices as well as on the quality of the land.

In periods of prosperity, land values are high and credit terms are apt to be generous. Keen competition for loans usually develops, and the tendency is to make more optimistic appraisals and to lend a larger percentage of appraised values. Even when the appraiser conscientiously attempts to arrive at a long-term value, and the lender attempts to gear his loan policy to the long-term outlook, both lender and appraiser will be influenced by the current market. One would expect, as a result, that many loans made during periods of farm prosperity would exceed the long-term debt-carrying capacity of the farms mortgaged. In the next period of distress such loans would break down more readily than loans made in more normal periods.

Unfortunately, foreclosure experience studies do not shed much light on the important subject of price influences at the time loans were made. Table A-16, taken from Eckert and Maughan, shows

TABLE A-16

Relation of Period in Which Loan Was Made to Foreclosure Experience on Central Montana Wheat Farms, 1911-37

Period in which loan was made	*Number of loans made*	*Foreclosures*	
		Number	Percent
1911-19	165	115	70%
1920-24	190	70	37
1925-29	119	28	24
1930-32	55	2	4
1933-37	543	11	2
1911-32	529	215	41
1911-37	1,072	226	21%

From *Farm Mortgage Loan Experience in Central Montana*, by Phil S. Eckert and Orlo H. Maughan (Montana State College Agricultural Experiment Station, Bulletin 372, June 1939), Table 4, page 10.

much higher incidence of foreclosure among the earlier loans. Those made before 1919 were particularly bad. Similar though much less striking results were found in the studies of Hill and of Ackerman and Norton. Since farm land values and agricultural prosperity were extremely high during World War I, it is easy to conclude that the poor experience on loans made then was due to excessive lending on inflated values. But there is another possible explanation, namely that the early loans have had a greater opportunity to default than the later ones. Hill's study, for example, where only loans foreclosed before June 1, 1929 were included in the fore-

closed category, showed only 0.5 percent foreclosure among loans made in 1927 as against 8.4 percent for loans made in 1917.[12] But since the 1927 loans had only two years in which to develop trouble, while the 1917 loans had twelve years, the foreclosure rates are not comparable.

The last factor included under financial characteristics is the manner in which the farm was acquired by the borrower. It does not appear to be particularly important. Statistics on the manner of acquisition tend to be confusing, first because each investigator used a somewhat different classification system, and second because different investigators sometimes obtained contradictory results. For example, Hill found slightly worse than average results for purchased farms in contrast to farms acquired by trade, inheritance, or deals with relatives. Ackerman and Norton found better than average results for farms purchased with a cash down payment. Variation from the average appeared small, however, in both cases.

[12] Hill, *op.cit.*, Table 55, p. 55.

APPENDIX B

SOME TECHNICAL TERMS USED IN FARM INCOME ANALYSIS

FARM economists seem agreed that no single definition of farm income can be applied satisfactorily under all circumstances. To meet specific needs a large number of definitions have grown up, and with them a set of identifying terms—net cash income, return to capital, labor income, and so on. Since many of the terms have appeared from time to time in this book, we provide here working definitions, occasionally adding brief explanations. A complete discussion of farm income analysis is not intended. Emphasis is upon accounting under individual owner operation—but even that will not be covered completely—and virtually nothing will be said about aggregative income accounting for agriculture as a whole, or about landlord and tenant incomes.

The various definitions of farm income may be divided into two groups according to whether or not they take account of imputed income from farm perquisites and imputed costs of unpaid labor and capital furnished by the farm family. Table B-1 is an illustrative farm income statement from which all imputed items have been eliminated. It includes only the strictly financial transactions: bona fide money receipts, both cash and accruals; out-of-pocket operating expenses (cash and accruals) exclusive of family living; and an adjustment for changes in inventory.

The adjustment for inventory change requires comment, partly because it rarely occurs in this form in conventional corporate statements, and partly because the treatment of it in farm statements is not uniform. Undoubtedly some individual farm accounts follow corporate practice and dispense with the inventory adjustment altogether. When the adjustment is used, the primary purpose is to allow for crop carry-over and for changes in the value of the livestock inventory. Crops produced but not sold at year end are entered in the inventory, usually at current prices less estimated selling costs. An adjustment may be made also for the difference in the value of the livestock inventory at the beginning and end of the accounting year. In some systems of income analysis the inventory adjustment serves also as a depreciation account, as is indicated in Table B-1, which is specially itemized for purposes of illustration.[1]

[1] Handling depreciation through the inventory account follows an old system of payments and balances that was used by corporations before the days of depreciation accruals. In modern accounting, depreciation expense is charged directly against income through a special account set up for the purpose. The difference between the two methods is largely a matter of arrangement and presentation,

TABLE B-1

An Illustrative Farm Income Statement, Imputed Items Excluded

Receipts		
Crop sales	$4,500	
Livestock sales	3,000	
Miscellaneous	500	
		$8,000
Expense		
Hired labor	$1,000	
Feed, supplies, seed, etc.	1,500	
Livestock bought	1,000	
Tractor bought	800	
Real estate taxes	500	
Miscellaneous	200	
		5,000
NET CASH INCOME		$3,000
Net inventory change: increase		
Value of tractor at year end ($800 cost less $200 depreciation): increase	$600	
Crops and livestock on hand: increase	800	
Depreciation on buildings: decrease	400	
		1,000
NET OPERATING INCOME		$4,000
Interest on mortgage		500
NET INCOME		$3,500

But the practice is not universal. In some of the aggregative series of the Bureau of Agricultural Economics, depreciation is entered directly as an expense.

however, for both methods use the same basic data and eventually arrive at the same values for net operating income and net income.

The illustrative farm income statement contains, for example, an expense of $800 for the purchase of a new tractor. At the end of the year, however, that expense is offset by an increase in inventory of $600, equal to the original purchase of $800 less estimated depreciation of $200. In modern corporation accounting, on the other hand, only the $200 expense item would appear in the income statement; the original purchase would not be included, since it would be considered a capital expenditure.

In the hypothetical statement three measures of income are highlighted: net income, net operating income, and net cash income (sometimes called net cash farm income). Net income is the farmer's final profit for the year—the amount on which he might pay an income tax.[2] Nevertheless, it is not extensively used by farm income analysts, partly because it takes no account of imputed income and costs. Net operating income is a standard concept in modern corporation accounting. It rarely if ever appears in farm accounts, but it might be used in farm income analysis as indicated in Chapters 7 and 8, which deal with that subject. Net cash income is a common concept in farm accounting. It was used by O. H. White in his study of capacity to repay debt, and it appears in the Department of Agriculture annual series net cash income of farm operators.

In the long run, net cash income and net operating income will be approximately equal, and if "the long run" happens to begin with the purchase of a farm and end with its sale, the two will be exactly equal. In the short run, however, substantial differences may appear from time to time. In general, net operating income will be more stable than net cash income. To illustrate with an extreme example, suppose that a farmer who keeps his books by the calendar year ordinarily sells his crops at the end of December, but in a certain year, say 1950, defers his selling until early January of the following year. In 1950, then, his net cash income will show a substantial loss because there were no cash receipts during that year though expenses occurred as usual. But in 1951 net cash income will be greatly swollen by the concentration of two full years' receipts into one year. Net operating income, on the other hand, will not be similarly affected. At the end of 1950 there will be a large increase in inventory as a result of the unsold crops, approximately compensating for the lack of cash sales during the year. In 1951, there will be a substantial decrease in inventory—from the previous year's abnormal accumulation—which will compensate for the two years' concentration of cash sales.

The income statement of Table B-1 may be modified by the inclusion of various imputed costs and returns. Two systems of modification have been encountered in data from studies discussed in this book, one used by some of the eastern land grant colleges, the other used by the Bureau of Agricultural Economics. Table B-2 illustrates some of the modifications used by the land grant colleges. The calculation of the return to capital under Alternative 1 is to provide an estimate of the investment return from a farm after allowance for all costs, including the operator's labor and manage-

[2] In view of the many intangibles in farm accounting and the substantial number of farmers who keep few or no accounts, it is impossible to say with assurance that net income—or any other quantity—is generally used for tax calculations.

ment. An analogous calculation, designed to measure returns to labor, is included under Alternative II. There the crucial step is a deduction for the imputed cost of capital, whether furnished by the operator or borrowed at going interest rates. The usual method of determining the cost is to multiply the total farm capital by the estimated average mortgage interest rate for the area under consideration.

TABLE B-2

An Illustrative Farm Income Statement: Imputed Adjustments Used by Some Eastern Land Grant Colleges

Alternative I, return on capital		
NET OPERATING INCOME (from Table B-1)		$4,000
Unpaid family labor		500
FARM INCOME		$3,500
Operator's labor and management		1,500
RETURN ON CAPITAL		$2,000
Alternative II, returns to labor		
NET OPERATING INCOME		$4,000
Interest on total capital at 5 percent[a]		1,200
FAMILY LABOR INCOME		$2,800
Unpaid family labor		500
OPERATOR'S LABOR INCOME		$2,300
Value of farm perquisites		
Rental value of house	$900	
Farm products used	500	
		1,400
OPERATOR'S LABOR EARNINGS		$3,700

[a] The 5 percent figure is chosen arbitrarily for illustration. Ordinarily, one would estimate the average going interest rate in the area under consideration.

Table B-3 illustrates some of the imputed adjustments used by the Bureau of Agricultural Economics. For the sake of authenticity, actual averages for central New York dairy farms are used, rather than hypothetical figures as in the preceding tables. Of the various adjustments presented, the allocation to labor deserves particular attention because it appears in Table 27 (Chapter 7). The amount

allocated to labor is a residual after deduction of the allocation to capital.

It is noteworthy that the BAE method of imputing a capital cost differs somewhat from that of the land grant colleges. To impute the cost of working capital, the value of working capital is multiplied by an estimated average interest rate for the region, which is consistent with the college method; but the imputed cost of land and buildings is determined from estimated net rentals rather than from an interest rate.

TABLE B-3

Combined Income Statement for Central New York Dairy Farms, Averages for Eleven Years 1930-40

Cash receipts		$2,317
Cash operating expenditures (excludes family living expenditures)		1,555
NET CASH FARM INCOME		$762
Net inventory change: decrease		26
NET OPERATING INCOME		$736
Value of perquisites (farmhouse, fuel, vegetables, etc.)		416
NET FARM INCOME		$1,152
Rent and interest paid		140
OPERATOR'S NET FARM INCOME		$1,012
Allocation of net farm income		
To capital:		
Net rental value of land and buildings less upkeep	$301	
Interest on working capital[a]	211	
		512
To labor:		640
		$1,152

From *Typical Family-Operated Farms, 1930-45, Adjustments, Costs, and Returns*, by Wylie D. Goodsell, Ronald W. Jones, and Russell W. Bierman (Bureau of Agricultural Economics, F.M. 55, April 1946), page 33.

[a] Obtained by multiplying the total amount of working capital (machinery, equipment, livestock, and crops on hand) by an average interest rate for the region.

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- I-A(1-7). Fruit and mixed farming
- I-B(1-7). Fruit, truck, and mixed farming
- I-C(1-2). Truck and mixed farming
- I-D(1). Truck

II. Range livestock

- II-A(1-6). Seasonal grazing, migratory
- II-B(1-8). Seasonal grazing, nonmigratory
- II-C(1-4). Upland summer grazing
- II-D(1-4). Year-long grazing

III. Wheat and small grains

- III-A(1-4). Specialized wheat
- III-B(1). Wheat and peas
- III-C(1-5). Wheat and range livestock
- III-D(1). Wheat, grain sorghums, and range livestock
- III-E(1-4). Wheat and general farming
- III-F(1). Small grains

IV. Dairy

- IV-A(1-6). Specialized dairy
- IV-B(1-2). Dairy and livestock
- IV-C(1). Dairy, hay, and potatoes
- IV-D(1-2). Dairy and cash crops
- IV-E(1-4). Dairy, poultry, and mixed farming
- IV-F(1-6). Dairy and general farming

V. Feed grains and livestock (Corn Belt)

- V-A(1-2). Cattle feeding and hogs
- V-B(1-2). Cash corn, oats, and soybeans
- V-C(1-2). Hogs and soft winter wheat
- V-D(1). Livestock, dairy, soybeans, and cash grain
- V-E(1). Hogs and dairy
- V-F(1-5). Livestock and cash grain
- V-G(1). Livestock, cash grain, and dairy
- V-H(1-2). Livestock and pasture

VI. General farming

- VI-A(1). Dairy and livestock feeding, irrigated
- VI-B(1). Dairy, hay, and sugar beets, irrigated
- VI-C(1). Dairy and range livestock, small-scale
- VI-D(1-7). Livestock and special crops, irrigated
- VI-E(1-3). Livestock and cash grain
- VI-F(1). Livestock, truck, and cotton, small-scale
- VI-G(1-3). Dairy, livestock, and poultry
- VI-H(1-4). Livestock and tobacco
- VI-J(1-2). Livestock and dairy
- VI-K(1). Livestock, fruit, and tobacco, small-scale
- VI-L(1). Truck, tobacco, and livestock
- VI-M(1-2). Forest products, truck, and cotton, small-scale

VII. Cotton

- VII-A(1-8). Specialized cotton
- VII-B(1). Cotton and tobacco
- VII-C(1). Cotton, tobacco, hogs, and peanuts
- VII-D(1-2). Cotton and livestock
- VII-E(1). Cotton and range livestock
- VII-F(1). Cotton and sugarcane
- VII-G(1-2). Cotton and wheat
- VII-H(1-5). Cotton and general farming
- VII-J(1). Cotton and forest products
- VII-K(1-3). Irrigated cotton and alfalfa

VIII. Tobacco and general farming

- VIII-A(1-2). Flue-cured
- VIII-B(1). Burley
- VIII-C(1). Dark
- VIII-D(1). Southern Maryland

IX. Special crops and general farming

- IX-A(1-2). Rice
- IX-B(1). Sugarcane
- IX-C(1-2). Potatoes
- IX-D(1-3). Peanuts
- IX-E(1-2). Potatoes, dry beans, sugar beets, and livestock, irrigated
- IX-F(1-3). Sugar beets, dry beans, and livestock, irrigated
- IX-G(1). Dry beans, nonirrigated

X. Nonfarming

- X-A(1-3). Deserts
- X-B(1-12). Mountains and forests
- X-C(1-2). Lowlands and everglades