

Northern agricultural development after the civil war

15

Before the Civil War—and for a short time afterward—agriculture was pre-eminent in America. In 1860 there were just over 2 million farms in America. Forty years later there were 5.75 million farms, and land in farms had more than doubled to a little over 840 million acres. Nevertheless, agriculture did not grow as rapidly as other sectors of the economy, and productivity was low compared with that in manufacturing. In 1860, for example, agriculture employed six times as much capital as manufacturing and two and one-half times as many people, yet produced just twice as much value added. Before the Civil War, however, northern agriculture contributed more to commodity output than did manufacturing; producing output was valued at \$853 million (in 1879 prices), compared with \$821 million for manufacturing and mining (see Table 13.9 above). But the lead did not last long. By 1880 the value of manufacturing and mining commodity output in the North, \$2.015 million, exceeded that of agriculture, \$1.861 million. As agriculture failed to keep pace with other sectors of the economy, the share of population living on farms or in rural areas also declined. In 1860 about 80 percent of the population was living in communities of fewer than 2,500 but by 1900 only 60 percent lived in such places. In 1880, the earliest date for official statistics of the farm population, 43.8 percent of the population—about 22 million persons—lived on farms. Twenty years later the fraction had slipped to only 41.9 percent, and beginning in the late 1930s the absolute number of people in agriculture also began to decline. By 1990 less than 2 percent of the population—about 4.5 million people—still lived on farms.

The transformation of America from a rural, agricultural economy to an urban-industrial economy had a profound and oftentimes traumatic effect

upon the farm sector. As one historian has put it, "Perhaps no development of the nineteenth century brought greater disappointment to the American farmers than did their failure to realize the prosperity that they had expected from industrialism."¹ In this chapter the focus is on the changes in agriculture in the northern states and how farmers sought political solutions to their real or imagined economic problems. In subsequent chapters we shall see how some of these political solutions affected the other sectors of the economy and shaped many of our institutions.

Much of agriculture's dramatic post-Civil War expansion took place in the Midwest and West, partly in response to the Homestead Act and other changes in federal land policy. Whereas in the Northeast the number of farms increased by only about 20 percent, in the Midwest the number tripled, and out West the number grew sevenfold. Improved acreage—that is, land planted in crops—expanded particularly rapidly in Missouri, Iowa, Kansas, Nebraska, Minnesota, and the Dakotas and in the Central Valley of California (Figure 15.1). Millions of acres of once-virgin land were brought under the plow, sometimes with disastrous ecological consequences.

As land in farms expanded, agricultural output grew dramatically. Gross farm output increased at an average annual rate of 2.5 percent between 1869 and 1909, with corn production growing 3.1 percent per year and wheat production 2.2 percent per year.² Much of this growth, however, was extensive rather than intensive. Western wheat yields, for example, rose only one bushel per acre to fourteen bushels per acre between 1840 and 1910, partly because labor supply problems in northern agriculture encouraged the use of ever more land-extensive farm practices.³ Despite the rapid growth in output, however, total factor productivity in agriculture lagged well behind that of the rest of the economy. The average annual improvement for the farm sector was only about 0.7 percent, and just 0.6 percent for the midwestern Grain Belt, compared with 1.7 percent for the nonfarm sector between 1889 and 1899.⁴ Nonetheless, as we have seen (Chapter 10), massive doses of capital in the form of laborsaving machinery did allow substantial increases in labor productivity.

Federal land policy and improved transportation had opened up vast areas of the continent to farming and settlement, but much of the new land, particularly in the high plains and the Far West, was marginal and ecologically fragile. By 1859 the center of wheat production in the United States was near Indianapolis, and in the years that followed it shifted farther west,

¹ Saloutos (1948)

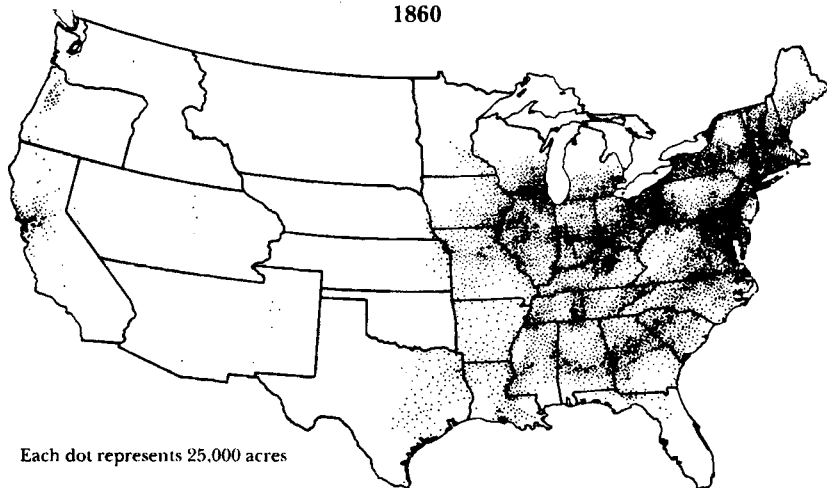
² Kendrick and Peck (1961).

³ Parker and Klein (1966). In the South, however, emancipation was accompanied by a sharp increase in yield per acre for most crops as southern agriculture switched from land-extensive and (slave) labor-intensive methods toward more land-intensive cropping patterns by croppers and tenants, with the size of the lots being determined by the landlord so as to maximize the rent—that is, the surplus production from the land.

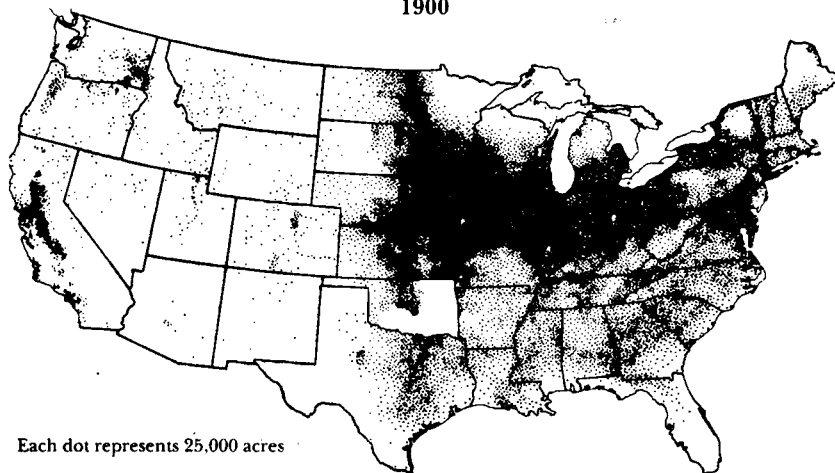
⁴ Kendrick and Peck (1961).

FIGURE 15.1
Improved Land

1860



1900



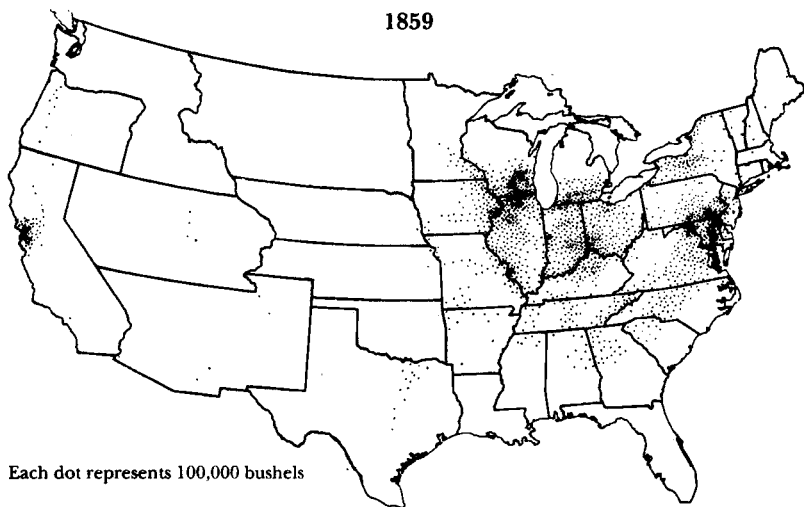
Source: Charles O. Paullin, *Atlas of the Historical Geography of the United States* (Washington, D.C.: Carnegie Institution, 1932): Plates 144D and 144H.

being located in western Iowa by 1919. As the center of wheat production shifted farther west, two distinct wheat-growing areas emerged: hard spring-planted wheat in the northern plains states and Minnesota, winter wheat to the south from southern Illinois through Kansas and Oklahoma (Figure 15.2). Sandwiched between the two was the Corn Belt (Figure 15.3). The

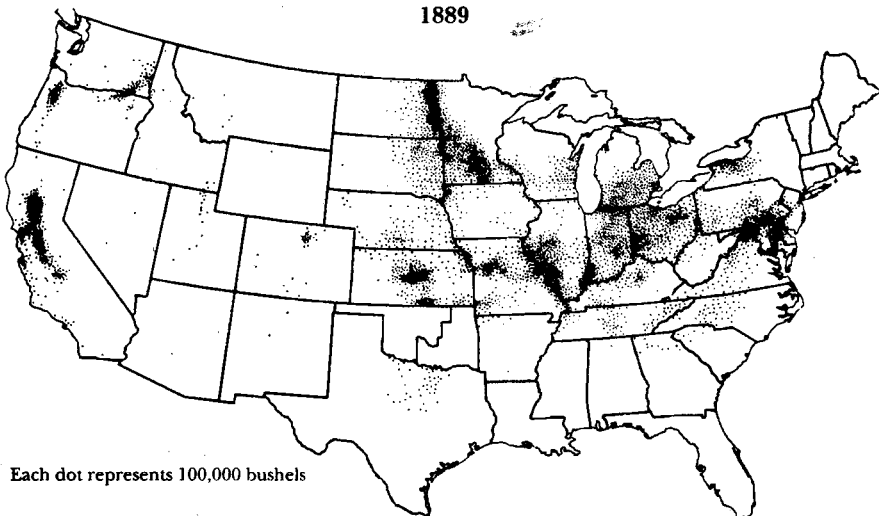
FIGURE 15.2

Wheat Production

1859



1889

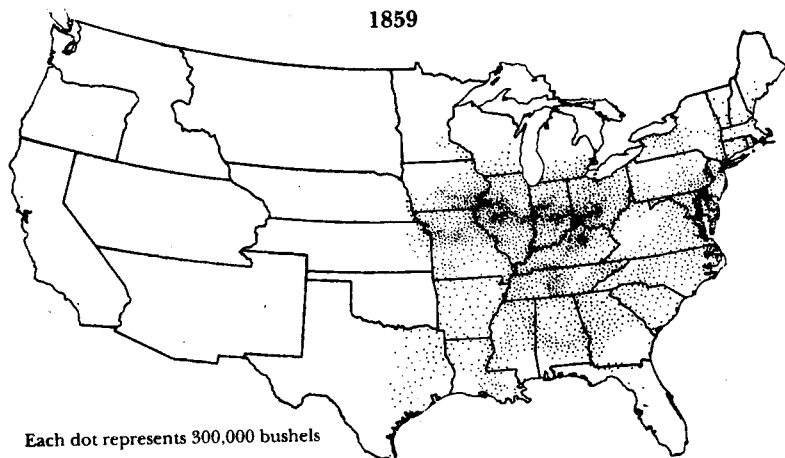


Source: Charles O. Paullin, *Atlas of the Historical Geography of the United States* (Washington, D.C.: Carnegie Institution, 1932): Plates 143Q and 143R.

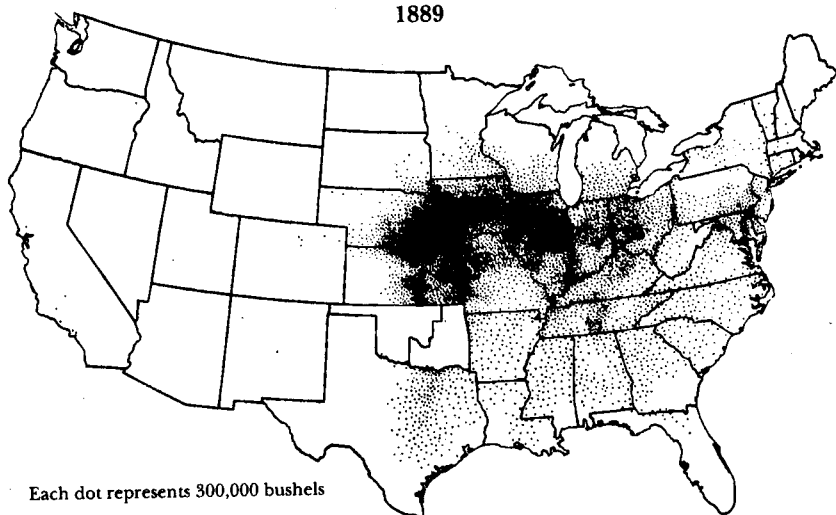
emergence of the Wheat Belts and the Corn Belt in the North reflect growing regional specialization, defined as the fraction of the nation's output of a crop produced by a particular region, in American agriculture. However, whereas southern cotton farms after emancipation grew more cotton and less of everything else, northern farms remained relatively and absolutely

FIGURE 15.3
Corn Production

1859



1889



Source: Charles O. Paullin, *Atlas of the Historical Geography of the United States* (Washington, D.C.: Carnegie Institution, 1932): Plates 143L and 143M.

more diversified until the twentieth century. Indeed, recent research has found that farmers in Missouri at least actually became less specialized, growing a greater diversity of crops, in the years before 1880.⁵

⁵ Gregson (1993).

Farm Tenancy and the Agricultural Ladder

The progressive liberalization of the terms of transfer of the public lands into private hands must have limited the scarcity value of land in the nineteenth century. Locational advantages, such as proximity to a city or access to cheap transportation, still, of course, carried a premium, but even close to cities, rapid urbanization and the spread of the rail network did much to diffuse those gains over a wide area. Over time, land prices rose, reflecting a myriad of different factors, including improvements made to the land, increased demand, changes in locational advantage, as well as decreased supply (Figure 15.4). Between 1850 and 1915, for example, the real value of land rose at an average annual rate of 2.08 percent, increasing more than fourfold over the period. This rise might have been even faster—2.18 percent a year—had not the drift to poorer-quality land in the West more than offset the 0.29 percent per year quality gain through improvements to fixed sites.⁶ Even so, land prices in America were low relative to elsewhere in the developed world of the nineteenth century. Land prices were also undoubtedly lower than they would have been in the absence of the liberal federal land policy. Because land was relatively cheap in America, the dominant view in American history has been that anyone who wanted land in the nineteenth century could have it.

This interpretation did not go unchallenged. Reversing the logic of the traditional argument that free or cheap land promoted ownership, the noted agricultural historian Paul W. Gates claimed that the system instead promoted the growth of tenancy: "The Land Ordinance of 1785 and subsequent laws had placed no restrictions upon the amount of public land that individuals or groups could acquire. . . . The policy of unlimited sales and unrestricted transfer of titles made possible land monopolization by speculators, who acquired most of the choice lands in certain areas. . . . This resulted in the early disappearance of cheap or free land and the emergence of tenancy."⁷

In Gates's view, passage of the Homestead Act in 1862 simply exacerbated the problem as speculators found dummy entrymen to file claims, made fraudulent land entries, and took advantage of the commutation privilege of paying \$1.25 an acre to receive title rather than cultivate the land for five years and receive the land for free. As a result, large tracts of land were acquired by speculators, land companies, and the wealthy. Moreover, the railroads were given vast acreages through federal land grants with the result that the market supply of land was reduced and price was bidden up.

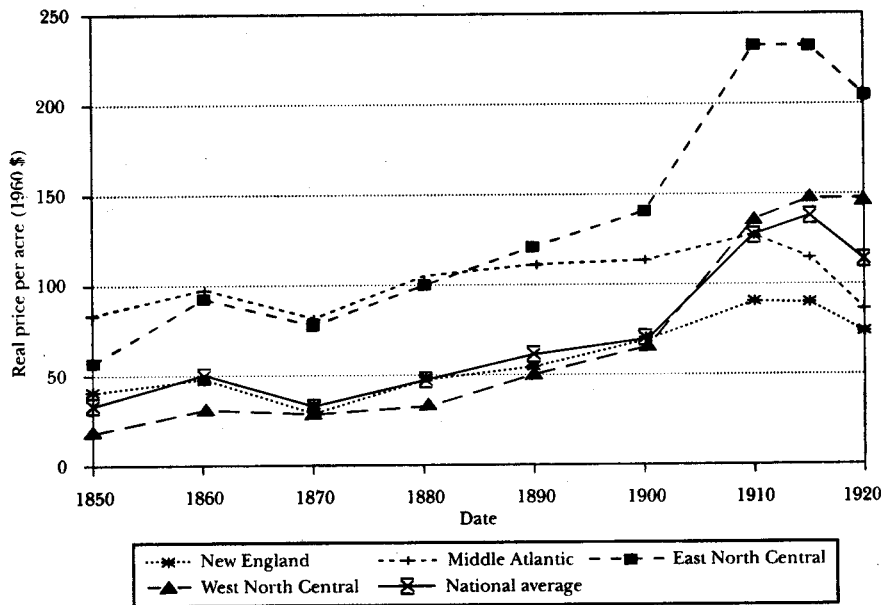
Higher land prices meant that would-be farmers were compelled to spend more of their incomes on land since the demand for land was inelas-

⁶ Lindert (1988).

⁷ Gates (1939): 3.

FIGURE 15.4

Real Price of an Improved Acre of Farmland



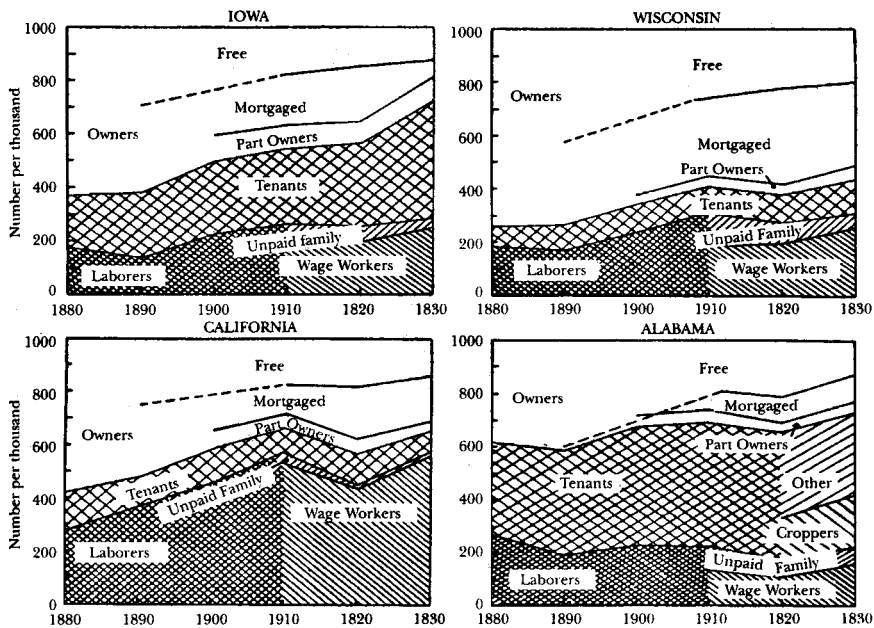
Source: Peter H. Lindert, "Long-run Trends in American Farmland Values," *Agricultural History* 63 (1988): 52-53, Table 2.

tic. Those who could not afford to pay these higher prices and could not borrow were faced with a choice of farming smaller areas or becoming tenants. Some may have been excluded from the land market altogether, forced into farm wage labor or pushed into seeking their livelihoods elsewhere.

When the first statistics on tenancy were collected in 1880, they showed that nationwide a quarter of all farmers did not own the land they farmed. Although tenancy was common almost everywhere, it was most prevalent in the South. Perhaps more surprisingly, tenancy rates in the Midwest—where settlement had taken place most recently and under the supposedly favorable conditions created by federal land policy—were higher than on the East Coast, where factors promoting economic concentration, such as luck, superior ability, and inheritance, not to mention institutional factors, such as the manorial settlement patterns in early New York, had operated longer. Subsequent censuses revealed steady increases in the tenancy rate. In state after state the fraction of farmers who owned their farms shrank. In the western part of the Midwest, for example, tenancy increased 50 percent between 1880 and 1900. Elsewhere in the United States the rate increased about 30 percent over the period. In 1880 almost a quarter of Iowa farmers were ten-

FIGURE 15.5

Relative Size of Tenure Categories in Four States, 1880–1930



Source: John D. Black and R. H. Allen, "The Growth of Farm Tenancy in the United States," *Quarterly Journal of Economics* (1937): 401.

ants. By 1900 more than a third were tenants, and by 1930 the tenancy rate in Iowa neared one-half. In Wisconsin more farmers owned their land, but even there the trend was the same. In 1880 the tenancy rate in Wisconsin was about 9 percent, by 1900 it was 13.5 percent, and by 1930 it had risen to 18.2 percent (Figure 15.5):

The question that interested agricultural economists and agricultural historians was why tenancy rates were increasing. Some viewed tenancy as "a convenient way of approach to full ownership. It is, in fact, part of the agricultural ladder . . . one step in the process whereby a man starting in life with limited capital, or with nothing but his own energy and enterprise, and after a time acquire the ownership of a farm."⁸ Gates and others, however, thought that tenants were yeomen who had fallen on hard times and were slipping back down the agricultural ladder toward landless wage labor. While Gates blamed federal land policy itself, others suggested that the closing of the frontier had cut off the supply of good, cheap public land. Yet others blamed economic adversity. In the farm crisis that began with the

⁸ Goldenweisser and Truesdell (1924).

Depression of 1921 and ended with the outbreak of World War II, for example, an average of ninety-six thousand farms per year were foreclosed. At the peak of the crisis in 1933 two hundred thousand farmers lost their farms and were either driven from the land or lapsed into tenancy.⁹

The premise of the agricultural ladder thesis is that there is occupational (and economic) mobility over the life cycle of each individual. This mobility could be up—as assumed by the optimists—or down—as assumed by the pessimists. On the optimists' side, a study conducted as part of the 1920 census found that at least half of all new tenant farmers in the northern half of the United States between 1915 and 1920 had once been farm wage laborers. On average, farm laborers had become tenants by their late twenties in Iowa, Minnesota, and Wisconsin and by their early to mid-thirties elsewhere in the North, except for Massachusetts and New Hampshire, where they had to wait until their late thirties. Tenants also rose to become owners. At least 30 percent outside New England—50 percent or more in the Midwest—of persons who became yeoman farmers during the same period had once been tenants. Upward mobility was thus quite pronounced during the period. It was also quite swift. In Illinois, for example, the truly upwardly mobile—those who had been both laborers and tenants before becoming owners—had spent an average of 6.2 years as laborers and 11.1 years as tenants. In Wisconsin progress was even swifter with an average of only 5.8 years as laborers and 6.1 years as tenants before rising to owners.

However, there was also evidence of some downward mobility. In 1920 about 20 percent of tenants across the northern states farmed land they once had owned. Much of this downward mobility was attributed to inefficiency and misfortune rather than to "the system."¹⁰

In general, though, it is extremely difficult to document the agricultural ladder because it requires detailed individual life histories. Instead researchers have relied upon cohort analysis—the study of individual groups born within specific time intervals—across successive decennial censuses. The problem with this approach is that cohort membership changes over time, making definitive interpretation risky. Nevertheless, some conclusion can be drawn from the evidence. The data show that more young farmers began as tenants and more remained in each age-group over time.¹¹ In 1890 more than half of all farmers under twenty-five years old nationwide began as tenants. By 1910 more than three-quarters started out this way (Figure 15.6). The data would thus more than seem to justify the pessimism that movement on the ladder was predominantly one of descent rather than ascent. However, if it is assumed that each age cohort at successive censuses is composed mainly of survivors from the younger cohort at the preceding census (a possibly heroic assumption), then the percentage in any age co-

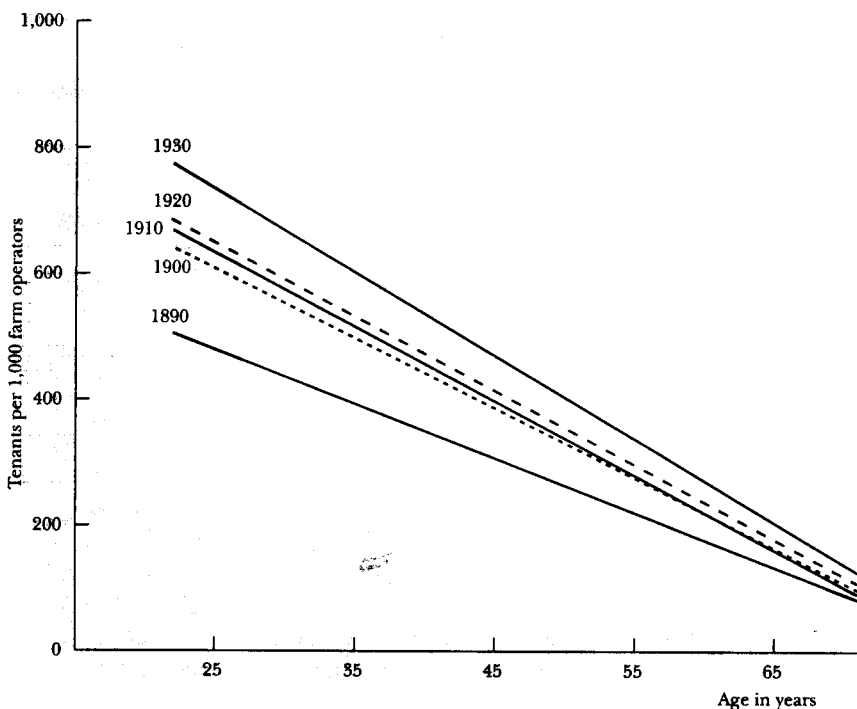
⁹ Alston (1983).

¹⁰ Goldenweisser and Truesdell (1924).

¹¹ Atack (1988); Wright (1988).

FIGURE 15.6

Tenancy Rates by Age of Farm Operator, 1890-1930



Source: John D. Black and R. H. Allen, "The Growth of Farm Tenancy in the United States," *Quarterly Journal of Economics* 51 (1937): 410.

hort at one census should have exceeded that in the younger age cohort at the preceding census if farmers were backsliding into tenancy. Instead the reverse was true, except between 1890 and 1900, when the agricultural crisis was particularly severe.

The pattern of rising tenancy, particularly among young farmers just embarking upon their careers, is consistent with the view that rising capital costs over time, driven largely by rising land values, posed an increasing barrier to entry. The data also reveal that tenancy rates for different decades tended to converge among the more elderly so that the fraction of septuagenarian farm operators who were tenants was almost a constant. If success is defined as owner occupancy among those who remained in farming, then success was approximately constant over the forty years from 1890 to 1930 and maybe even since 1850. Unfortunately the data provide no clue to whether these people were tenants because they chose to be or whether the economic system generated a more or less constant fraction of aspiring farmers who failed in their bids for owner occupancy yet refused to quit the business.

Farm Mortgages and Foreclosure

Farming became increasingly expensive in the late nineteenth century. The real price of land was rising throughout the period until after World War I.¹² Mechanization further strained the financial resources of farmers. For many, tenancy was the only way to farm, but others chose to borrow. For some, borrowing was a fatal mistake, which resulted in foreclosure and loss of the family farm. Others were successful, but they had to pay close attention to agricultural product markets and the farm cash flow to generate the cash to meet their periodic financial obligations and avoid default. Even for the successful farmer, however, a mortgage in the nineteenth century must have been cause for worry. The only available mortgages were short-term balloon mortgages. Such loans were unamortized—that is, periodic payments met the interest obligations but contributed nothing to the principal, which was payable in full upon expiration of the mortgage. Mortgage terms were typically three years or less and might be renewed, though terms were never certain. Why? One suggestion is that such arrangements were preferred by lenders (since they could be rolled over—an important consideration when interest rates themselves were uncertain) and by creditworthy borrowers (who would signal their creditworthiness by accepting shorter-term mortgages with the expectation of more certain renewal).¹³ The long-term, amortized mortgages familiar today did not begin to appear until the 1920s.

Farmers in the late nineteenth century complained that monopoly power allowed the representatives of banks and insurance companies to charge interest above competitive rates. The evidence, however, suggests that the western mortgage industry was immensely competitive, thanks, ironically, to the entry of the hated eastern moneylenders into the western market. Interest rates in the 1850s in Iowa averaged 10 percent, which was the usury limit in many states; true interest rates, after allowances for fees, commissions, and so on, were probably much higher. By the 1890s, though, interest rates had declined to 6.5 to 7.5 percent, still higher than interest rates on gilt-edged securities, but the higher rates on farm mortgages probably only reflected the risks of farming on the Great Plains in the 1880s.

There is a subtler argument against agricultural creditors that, on initial hearing, appeals to economists. Mortgages are fixed obligations in money terms, not in real value terms. Hence in a period of declining prices, like the first three post-Civil War decades, mortgage holders were paid back in increasingly valuable dollars by property owners whose incomes were not necessarily growing apace with their financial obligations. The flaw here is that market interest rates adjust to anticipated price trends. Only if debtors fail to

¹² Lindert (1988).

¹³ This point has been forcefully and persuasively made by Kenneth Snowden in recent professional presentations.

anticipate declining prices do they truly lose out. And it is hard to believe that farmers' price expectations could have failed to adjust to a trend that lasted thirty years. Farmers were simply not likely to borrow at interest rates that they knew could not be supported by future crop revenues. Moreover, with a short time to maturity, any losses caused by unanticipated price changes should have quickly worked through the system.

In 1890 only 29 percent of farmers were encumbered by mortgages. Among those who were, the debt averaged only 35 percent of their worth. Debt rates were higher in the troubled plains states (60 percent in Kansas, 54 percent in Nebraska). In the years that followed, the average mortgage debt relative to equity fell but more and more farmers became encumbered (Table 15.1).

TABLE 15.1

Percentage of Owner-Occupied Farms Mortgaged (of those reporting)

	1890	1900	1910	1920
New England	28.3	34.1	34.9	39.8
Middle Atlantic	37.0	40.3	38.3	41.1
East North Central	37.6	39.4	40.9	46.1
West North Central	48.0	44.3	46.1	56.9
South	5.7	17.2	23.5	29.0
Mountain	14.1	14.4	20.8	44.4
Pacific	28.7	27.6	26.8	52.1
U.S.	28.2	31.0	35.6	41.4
Non-South	39.9	39.1	40.1	49.4

Mortgage Debt/Farm Value on Mortgaged Farms

	1890	1910	1920
New England	40.4	31.8	33.8
Middle Atlantic	43.2	34.5	36.3
East North Central	33.2	28.6	31.2
West North Central	33.6	25.8	26.5
South	41.3	26.6	28.6
Mountain	31.8	23.9	30.5
Pacific	30.1	23.4	29.8
U.S.	35.5	27.3	29.1

Sources: Gavin Wright, "American Agriculture and the Labor Market: What Happened to Proletarianization?" *Agricultural History* 62 (1988): 187. Based upon data from 13th Census (1910), Vol. V, *Agriculture* (Washington, D.C.: Government Printing Office, 1913): 159-60; 14th Census (1920), Vol. V, *Agriculture* (Washington, D.C.: Government Printing Office, 1922): 484-86.

TABLE 15.2

**Probability of a Neighbor's Suffering Foreclosure at Various
Foreclosure Rates**

Local Annual Foreclosure Rate ^a	Probability ^b of At Least One Neighbor Suffering Foreclosure after:		
	1 year	2 years	3 years
1%	13%	26%	36%
2	26	45	60
3	37	60	75
5	54	79	90
10	79	96	99

^aAnnual number of foreclosures/total number of mortgages outstanding.

^bComputed using the binomial distribution with the assumption that fifteen neighboring farms are under mortgage and that the foreclosure of one farm does not affect the probability of a neighboring farm's being foreclosed.

Source: James Stock, "Real Estate Mortgages, Foreclosures and Midwestern Agrarian Unrest, 1865-1920," *Journal of Economic History* 44 (1984): 95. Reprinted by permission of Cambridge University Press.

The risk of individual foreclosure was quite small; the 1890 census quotes foreclosure rates of 0.61 percent in Illinois in 1880 and 1.55 percent in Minnesota in 1891, or between 2.4 percent and 6.1 percent of all mortgages, if we assume an average term of four years. Moreover, the average debt was small. As a result, Robert Fogel and Jack Rutner calculate that the overall wealth loss to farmers caused by foreclosures could not have been large. Even so, farmers probably had good reason to worry. Balloon mortgages, as many borrowers in the late 1970s and early 1980s can attest, carry substantial risk and fear of mortgage foreclosure in the face of repeated bad luck. Statewide foreclosure rates also may seriously understate the risk of foreclosure since it appears that mortgages were particularly heavily concentrated in just a few counties in each state. Indeed, estimates of the probability that a farmer had a neighbor who had been foreclosed are quite high (Table 15.2). Farmers were probably right to worry about foreclosure, particularly during some of the longer lasting periods of low farm prices or repeated harvest failures, such as the 1880s and the 1890s.¹⁴

The Integration of Northern Agriculture into the World Economy

The integration of markets—the bringing together of suppliers and demanders—is essential for economic efficiency. Although the Civil War appears to have interrupted this process, there is considerable evidence that

¹⁴ Stock (1985).

over time, price differentials between markets decreased and fluctuations were increasingly synchronous. That is, markets became increasingly integrated, whether for capital, labor, or products, both domestically and internationally. With the spreading rail network supplementing and eventually displacing much of the river and canal traffic, midwestern farmers were brought closer to East Coast and overseas consumers. The East Coast had long depended upon midwestern farmers to supply much of its needs in grains, and the two regions became ever more closely linked as transport costs and time in transit declined. Beginning in the 1850s, however, the midwestern grain market expanded overseas as Europe increasingly turned to American farmers for their supply of wheat. Initially, as during the Crimean War, the increase in foreign demand drove prices higher, but eventually supply expanded not just in America but also in the rest of the world. This expansion of the market had a profound impact upon the midwestern economy.

In the period 1875–79 the East Coast farmers produced barely half the wheat consumed there, while Britain produced just 41 percent of its consumption needs. By 1910–13 East Coast production relative to consumption had slipped to only 23 percent, and Britain met only 27 percent of its own needs.¹⁵ These grain deficits were met by imports from a growing number of countries, including Canada, Argentina, and Australia. Much, though, was supplied by midwestern farmers. In 1875–79 the East North Central states produced more than twice what they consumed; the West North Central states, two and a half times as much. By 1914 growing wheat specialization in the West North Central states had boosted their surplus to over 328 percent of consumption needs although in the East North Central states the replacement of wheat with corn had left that region just self-sufficient in wheat. Overall, midwestern wheat exports grew fourfold between 1870 and 1892, and agricultural exports in real 1913 dollars increased from \$248 million to \$986 million.

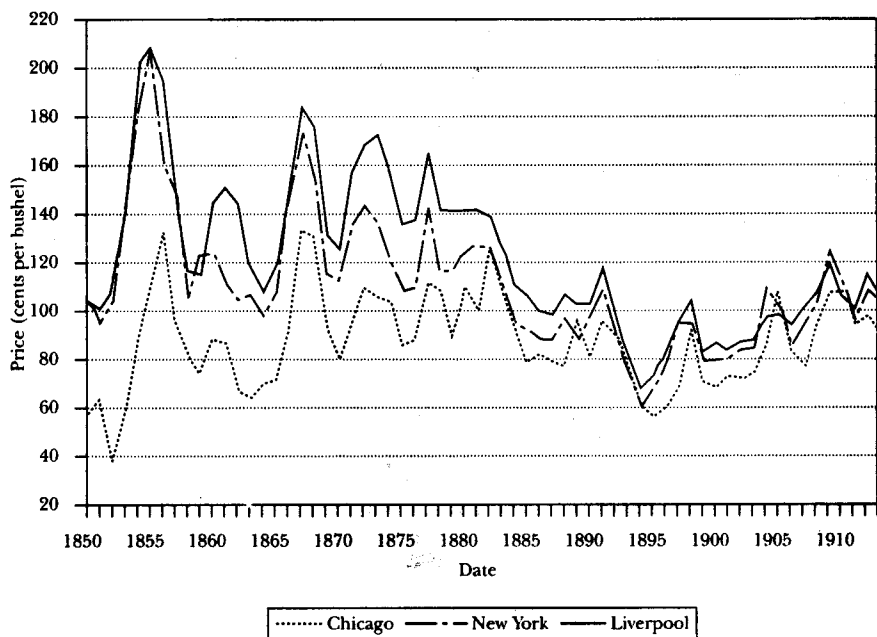
The increasing distance between producing and consuming regions would normally mean an increasing spread between the price received by the producer and the price paid by the consumer because of higher transport costs. Instead the gap narrowed dramatically and was virtually eliminated by 1890. For example, the price of No. 2 wheat in Chicago between 1852 and 1856 was less than half that in Liverpool. By 1880–85 it had risen to 84 percent of the British price, and by the eve of World War I the prices were virtually the same (Figure 15.7).

At the same time regional wheat prices within the United States also converged. In the late 1860s and early 1870s wheat prices in the midwestern wheat-growing states ranged from \$1.08 per bushel in Nebraska, where settlement was just beginning, to \$1.88 in Indiana, the state closest to the East Coast and European markets. This equals a price spread of 80 cents for a ho-

¹⁵ Harley (1978, 1980).

FIGURE 15.7

No. 2 Wheat Prices at Chicago, New York, Liverpool, 1850–1913



Source: Data from C. Knick Harley, "Transportation, the World Wheat Trade, and the Kuznets Cycle, 1850–1913," *Explorations in Economic History* 17 (1980): 246–47.

mogeneous, relatively inexpensive product. By the late 1880s the spread had narrowed to 37 cents, and by 1913 the spread was just 16 cents, with prices ranging from \$1.49 per bushel in Indiana to \$1.33 in Nebraska.¹⁶

The major factor underlying the dramatic reductions in price differentials was improvement in transportation. The spread of rail transportation into areas hitherto served only by wagon was accompanied by continued productivity gains in rail transportation that reduced the real cost of shipping and handling. In 1852–56 the freight cost on a bushel of wheat from Chicago to New York was 20.8 cents. By 1910–13 the cost had been cut to 5.4 cents. Moreover, the substitution of steam and iron for sail and wood reduced transatlantic shipping costs from 14.2 cents per bushel just after the Civil War to 4.9 cents by World War I (Table 15.3).

Analysis of the spatial price data by state and of the spreading rail network shows a strong supply response by farmers to both the price of wheat and the density of the rail system. Higher prices and greater railroad density

¹⁶ Harley (1978).

TABLE 15.3

Price of Wheat, Chicago, New York, and Liverpool with Transportation and Associated Costs, Average 1868-1872, 1880-1884, 1880-1884, 1910-1913

	Price of wheat (\$)							
	1868-1872		1880-1884		1910-1913			
	Spring	Winter	Spring	Winter	Lake & Canal	Lake & Rail	Lake & Rail	All Rail
Chicago	1.02	—	1.07	1.09				0.98
New York	1.32	1.39	1.17	1.20				1.05
Liverpool	1.52	1.63	1.31	1.35				1.07
Spread								
Chicago-New York	0.30	—	0.10	0.11				0.07
New York-Liverpool	0.20	0.24	0.14	0.15				0.02
	Transport and Costs(\$)							
	Lake & Canal	Lake & Rail	All Rail	Lake & Canal	Lake & Rail	All Rail	Lake & Canal	Lake & Rail
Chicago-New York	0.176	0.212	0.287	0.086	0.117	0.157	0.054	0.062
Freight rate	0.015	0.015	0.015	0.012	0.012	0.012	0.005	0.005
Chicago charges	0.009	n.a.	n.a.	0.003	n.a.	n.a.	0.003	n.a.
Insurance	0.027	n.a.	n.a.	0.022	n.a.	n.a.	0.005	n.a.
Buffalo charges	0.020	0.020 ^a	0.020 ^b	0.005	0.005	0.005	0.005	0.005
New York charges								
Total Chicago-								
New York	0.247	0.247	0.322	0.128	0.134	0.174	0.072	0.106
New York-Liverpool								
Freight rate	0.142			0.086			0.049	
New York charges	0.020			0.008			0.005	
Insurance	0.020			0.012			0.010	
Liverpool charges	0.070			0.065			0.005	
Total New York-								
Liverpool	0.252			0.171			0.069	

^a The rate of export reported as \$0.078^b George G. Tunell, "The Diversion of the Flour and Grain Traffic from the Great Lakes to the Railroads," *Journal of Political Economy* 5 (1897): 345, 346, suggests those charges were higher on grain arriving by rail.Source: C. Knick Harley, "Transportation, the World Wheat Trade, and the Kuznets Cycle, 1850-1913," *Explorations in Economic History* 17 (1980): 224-25.

led farmers to plant more acres and to do so rather quickly. Econometric estimates suggest that within six years of the advent of cheap overland transportation farmers would have expanded settlement and increased the area under cultivation by an amount sufficient to eliminate about half of any differential between actual and desired production of wheat. This pattern is consistent with the traditional explanation, which holds that falling agricultural prices in the late nineteenth century resulted from shifts in a highly elastic supply curve coupled with price inelastic demand that shifted only modestly in response to population growth and higher incomes.

Increases in supply were available at essentially constant marginal cost as farmers expanded onto new land or planted more of their old land in wheat. Supply shifted in response to transportation improvements, particularly an increasingly dense rail network that reduced the distance one had to ship by high-cost wagon transport to the nearest railhead. As a result, the gap between farm price and market price narrowed, with the bulk of the savings going to consumers by way of lower prices rather than to the farmers in terms of higher receipts for their crops. Demand plays essentially no role in this model of agricultural price determination. All the dynamics are supply-driven.

Jeffrey Williamson, however, disagrees with this characterization of the wheat market, at least for the late 1860s and early 1870s. While the price elasticity of domestic demand might have been very low because American consumers had few alternatives given the wedge of transport costs, the foreign demand for American grain was highly elastic. In the world wheat market the United States was still a small country and was a price taker rather than a price maker. Indeed, Morton Rothstein, the authority on the international grain trade, has argued that "by the mid-1880s there was almost universal acknowledgment of the crucial role of the British market in fixing prices."¹⁷ Certainly, the British were not dependent upon American wheat, for there were times when the British must have been supplied from elsewhere because the New York price of No. 2 wheat was above the Liverpool price. As price takers midwestern wheat producers were hurt by lagging total factor productivity down on the farm and increasingly inelastic land supplies that raised their costs of production. Nevertheless, expanding, price-elastic foreign demand for American wheat prevented the collapse of domestic wheat prices and may have played a crucial role in midwestern economic development and growth.

There are other reasons to believe that supply may have played a smaller role in the dynamics of the American wheat market in the years immediately following the Civil War than later on, especially in the 1880s. Although land

¹⁷ Rothstein (1960): 406.

entries reached a fifteen-year high in 1872, it was not until the 1880s that public land entries reached the levels achieved in the mid-1850s (see Figure 9.3 above). Similarly, while railroad construction boomed in the late 1860s and early 1870s, the principal beneficiaries were the residents of both coasts who were now linked by the transcontinentals. The railroad construction booms of the 1880s, on the other hand, were in areas already served by rail transportation (see Chapter 16). Indeed, it is precisely in this later period that the most dramatic narrowing in the price spread between the midwestern producers and consumers elsewhere takes place (see Figure 15.7). Conceivably, therefore, both Williamson and Harley are correct: Demand shifts played an important role in the determination of the price of wheat in the decade or so following the American Civil War, while supply shifts, primarily resulting from improvements in transportation, played the more important role later on.

The Late-Nineteenth-Century Farm Protest Movement

Many farmers were distinctly unhappy about many of the late-nineteenth-century agricultural developments: falling commodity prices, increased entry costs to farming, rising tenancy, and farm foreclosure, not to mention the supply uncertainties generated by harvests in other hemispheres and reliance upon markets an ocean away. Indeed, farmers were so unhappy that on December 4, 1867, Oliver Kelley, a Yankee government clerk appointed by President Andrew Johnson to investigate agricultural conditions in the southern states, organized a secret fraternal society for farmers known as the National Grange of the Patrons of Husbandry. By 1875 the Grange had more than 850,000 members and was a potent political force, particularly in the American Midwest. In Iowa in 1874 there was one grange for every seventy-five farm families; in Kansas, one for every sixty-six farm families. The Grange movement was just the first of a number of protest movements organized around disaffected farmers. Other organizations—the Greenbackers and the Alliance—soon followed, beginning a wave of protest that culminated in the Populist campaigns of the 1890s, which challenged established political parties and offered a prescription for the economic woes of farmers.

Until recently historians were inclined to take the protesters' complaints at face value, accepting the notion that farmers were trapped by relatively sluggish growth in demand for their products and by the economic power of railroads, land speculators, and banks. These traditional arguments are, alas, only weakly buttressed by evidence. Agricultural historian Theodore Saloutos probably got it right when he argued that it was the farmers' disappointment in their failure to realize the prosperity that they had ex-

pected that drove the agricultural protest movement of the late nineteenth century.

PRICES

Farm prices fell during most of the post-Civil War period. Corn that had sold for about 70 cents a bushel in the early 1870s fetched only 30 to 40 cents in the late 1880s. Wheat prices slipped from about \$1 to 70 cents during the same period, and cotton prices similarly declined by 20 to 30 percent. These figures are not very useful, however, even as a first approximation of the farmers' plight, for other prices fell as well. Conservative postwar monetary policies designed to retire the national debt, interacting with enormous improvements in industrial productivity and declining transport costs, led to a long decline in wholesale and consumer prices that ended only in the late 1890s. Consequently, the important index is what happened to the purchasing power of farm products—the terms at which farm output could be traded for other commodities.

The farm terms of trade index in Figure 15.8 shows a marked upward trend from the early 1870s onward, but it is a less than perfect measure of how farmers fared. Prices used in the construction of the index were mainly sampled in New York City, not in rural areas, and farm products cannot be separated from the all-commodity index to provide a price measure for the farm/nonfarm terms of trade. Still, at the close of the century the index stood 10 percent or more above the levels reached during the Civil War. This rise probably understates the true magnitude of the gains in farm terms of trade because the rise in the quality of nonfarm goods (despite their falling prices) was almost certainly greater than the rise in quality of agricultural goods, where the principal gain was from speedier delivery to the consumer made possible by the spreading railroad network. Estimates of the real value of farm revenue emphasize the economic gains made by the farm sector. For example, in Illinois, Indiana, Iowa, and Wisconsin—states where farm protest was both loud and persistent—farm purchasing power grew at about 2 percent or more per year from 1870 to 1900.¹⁸

THE SQUEEZE ON FARMERS

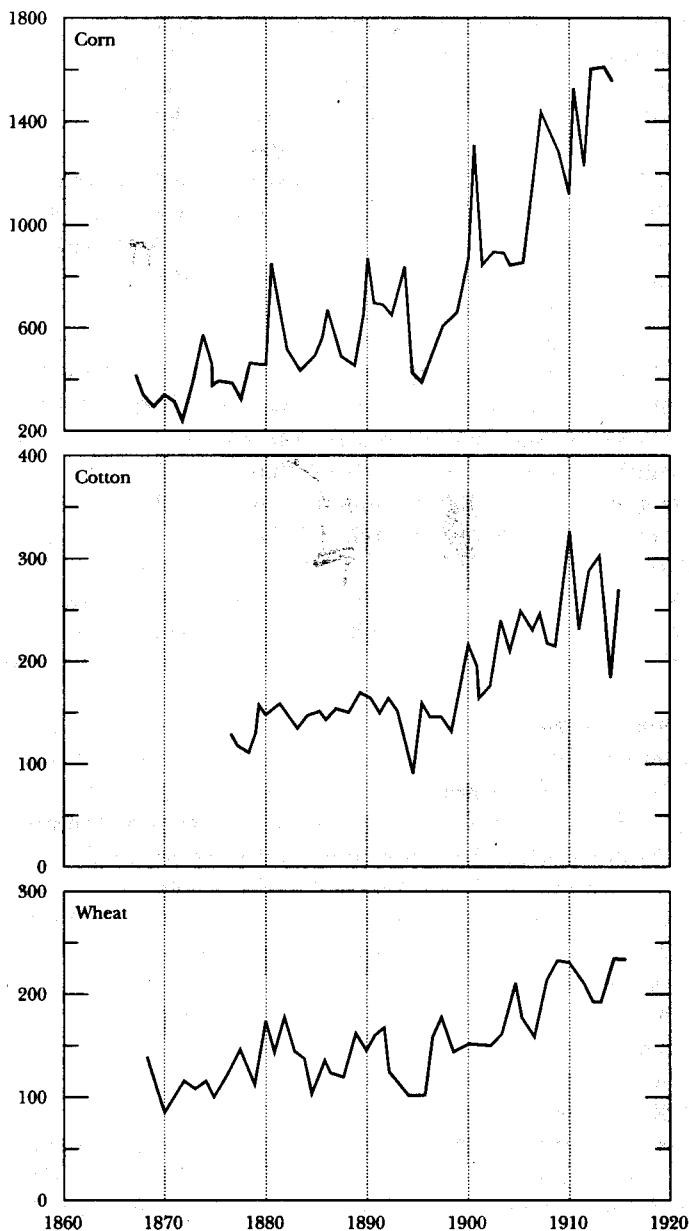
There is no doubt that farmers perceived themselves as victims, and they had no difficulty in identifying their oppressors. Enemy number one was the railroads, which farmers were convinced stole the profits of the land by charging monopolistic freight rates.

The evidence on railroad rates is mixed. Where railroads were competitive with each other or with water routes—that is, east of Chicago—rates

¹⁸ Bowman and Keehn (1974).

FIGURE 15.8

Indexes of Farm Prices Relative to Railroad Rates



were probably no higher than the average cost of providing the service. And the special economics of the railroad industry—enormous initial investments but very low operating costs—often led to rate wars in which shipping prices fell below the levels needed to generate adequate rates of return on railroad-invested capital. Farther west, however, there was less competition and consequently greater opportunity for profitable rate discrimination against local shippers. Undoubtedly at times there were routes where the railroads earned substantial monopoly profits at the expense of struggling farmers. However, it is difficult to make a strong case for widespread victimization of farmers. For the industry as a whole, any monopoly profits earned at the expense of some farmers were apparently frittered away in rate wars since the average profits of the industry were not particularly high.

Before 1890 railroad freight rates fell at about the same rate as farm prices. Thereafter they fell much more rapidly (Figure 15.8). Moreover, the railroads were just the first link in the distribution chain that linked mid-western farmers to European consumers. Between 1870 and 1900 Atlantic freight rates fell by two-thirds. Increased competition and organizational efficiencies guaranteed that reduced international distribution costs narrowed the gap between what consumers paid and what farmers got. As a result, the case for farmers as victims of a monopolistic transportation sector fades away.

If the railroads were public enemy number one, then moneylenders and land speculators competed for the honor of runner-up. The Populists believed that the interest demanded on farm mortgages was a form of blood-sucking, that the principal goal of lenders was farm foreclosure, and that the land speculators “overpriced” land, capturing gains that “rightfully” belonged to the farmer. All these arguments are relatively easily dismissed. If mortgage lending was competitive—and the evidence suggests that it was, with large numbers of personal and institutional investors from the East in search of good mortgages—then mortgage interest rates must have approached the market rate of interest, subject only to a risk premium. Lenders faced default risk, a potentially serious risk in times of falling land values, especially since their security was an asset whose value was presumably highest in the hands of the current farmer. It was not in the lender’s interest to incur foreclosure costs and potential capital losses. At the same time, though, there is a question of moral hazard. If farmers knew of these costs to the lender, they had an incentive to use the bargaining power that these costs conveyed to secure preferential terms by threatening default. What held this strategy in check was the short term of the mortgages, which made the system one of repeated games. That is, the strategy might work once, but lenders would have found a counterstrategy to negate the potential gains from threatened default to the borrowers. Finally, by definition, capital gains are unearned rents accruing as a result of secure property rights. They do not affect current resource use. The only economic question

is one of distribution. Late-nineteenth-century speculators, however, seem to have earned much lower returns than the pre-Civil War land speculators.

Why, then, did farmers complain? One possibility is that generalities about price trends, railroad rates, and loan costs mask great variations in the experiences of individual farmers. It is surely plausible that the system produced large numbers of losers who had much to complain about. It was of little comfort to a North Dakota farmer that rates extorted by the local carrier would be returned to other farmers somewhere down the line through cut-throat competition. For farmers so foolish or unlucky as to become caught between expensive mortgages and declining grain prices, the general improvement of the agricultural capital market would be no comfort at all. Protest movements don't run on averages. The big losers can carry the majority, particularly when the majority consists of those near the bottom of the economic ladder.

A variety of institutional changes exposed post-Civil War family farmers to greater risks than they had faced earlier. Prior to the war most farmers tried, with varying degrees of success, to produce surpluses for market sale, but farmers were not yet dependent upon the market. When wheat prices in the local market fell, say, by 10 percent in the 1850s, an Indiana farmer's total real income might fall by 3 or 4 percent. The blow was cushioned by the fact that the farmer consumed much of his or her own output as food, clothing, and shelter. Postwar grain farmers—like the postwar cotton farmers—were compelled by economic forces to sell a far greater proportion of their output in commercial markets. For example, machinery was needed to grow grain competitively, and with machines came fixed debt obligations that required large cash flows from the sale of cash crops to service the debt. Farm incomes were subject to greater leverage by price changes under these circumstances. The quarterly mortgage payment for an encumbered western Kansas wheat farmer remained the same, and so did the railroad freight rate, when the Chicago price of wheat fell 10 percent. Under such circumstances, net farm income after these unavoidable expenses might fall by 20 or 30 percent because of specialization. The fact that both the interest rate and the freight rate were determined competitively is cold comfort for those suffering a sharp income decline. Nor does the fact that in boom times the leverage works in reverse, magnifying the impact of market gains, help much.

Instead of serving customers just beyond the farm gate in isolated markets, America's farmers increasingly supplied consumers thousands of miles distant whose wants, tastes, and habits were transmitted by an impersonal market signal: price. That price reflected global supply conditions more than the local harvest, so that farmers could no longer count on higher prices to offset locally poor crops. Income variability and price uncertainty increased.¹⁹ Local capital markets offered little opportunity to smooth these

¹⁹ McGuire (1981).

fluctuations by saving during prosperous times and borrowing in times of distress.²⁰ In rural communities the principal asset was land, and the farm mortgage was about the only debt instrument available to farmers. Consequently, they bought more land in good times and took out mortgages in bad times, with the result that mortgage risk of foreclosure simply added to farm uncertainty.

In the decades following the Civil War, agricultural output growth was largely extensive. Some labor productivity gains were realized as grain farming mechanized, but nothing on the order of the productivity achievements of the industrial sector. Transport improvements opened vast new agricultural land areas that were capable of delivering grain to market at constant real resource cost. As a result, farm goods prices did not go up sharply with demand expansion, denying established farmers the especially high profits they might otherwise have received by entering the business on the "ground floor."²¹

This line of reasoning, incidentally, can be generalized to help explain the thread of agrarian discontent that runs from the Whiskey Rebellion in 1794 to the American Agriculture Movement of 1979. In competitive labor markets wages are determined by the minimum it takes to keep the marginal worker from moving to another industry or dropping out of the labor market altogether. Farmers are often unhappy with their wages because others are willing to work the land for very little return. When farm prices go up, raising the total return to farm enterprise, one of two things happens: Other farmers move onto virgin land, driving down land and produce prices and farmers' incomes, or if more good land is unavailable (the situation today in the United States), the price of existing acreage is bid up to the point where the return to labor services is back to the competitive rate. Those fortunate enough to own property receive capital gains from land, but the returns to current productive activity are depressed to the competitive margin, and entry for the next generation of aspiring yeoman farmers is that much more difficult.

Whether farmers' complaints were real or imagined, there is no doubt that their anger was very real and had a profound impact upon the politics and economic institutions of the late nineteenth century. The two main political parties could not afford to ignore the votes received by the protest parties such as the Populists or platforms that attracted those voters. Nor did they. Unhappy farmers led the march toward the regulation of the nation's railroads and the push toward antitrust. In their distrust of banks they promoted unit banking and fatally weakened the banking system in many states. Their desire as debtors for a more inflationary money supply based upon sil-

²⁰ Stock (1983).

²¹ North (1966).

ver generated a run against the dollar. In short, farmers stirred things up, as we shall see in some of the chapters that follow.

Bibliography

- Alston, Lee J. "Farm Foreclosures in the United States during the Interwar Period." *Journal of Economic History* 43 (1983): 885-904.
- Atack, Jeremy. "Tenants and Yeomen in the Nineteenth Century." *Agricultural History* 62 (1988): 6-32.
- Bogue, Allan. *Money at Interest: The Farm Mortgage on the Middle Border*. Ithaca: Cornell University Press, 1955.
- Bowman, John D., and Richard H. Keehn. "Agricultural Terms of Trade in Four Midwestern States, 1870-1900," *Journal of Economic History* 34 (1974): 592-609.
- Fogel, Robert W., and Jack Rutner. "The Efficiency Effects of Federal Land Policy, 1850-1900." In *Dimensions of Quantitative Research in History*, ed. William Aydelotte et al. Princeton: Princeton University Press, 1972: 390-418.
- Gates, Paul W. "Land Policy and Tenancy in the Prairie Counties of Indiana." *Indiana Magazine of History* 35 (1939): 1-26.
- . *Landlords and Tenants on the Prairie Frontier: Studies in American Land Policy*. (Ithaca: Cornell University Press, 1973).
- Goldenweisser, E. A., and Leon E. Truesdell. *Farm Tenancy in the United States*. (Washington, D.C.: 1924).
- Gregson, Mary Eschelbach. "Specialization in Late 19th Century Midwestern Agriculture: Missouri as a Test Case." *Agricultural History* 67 (1993): 16-35.
- Harley, C. Knick. "Western Settlement and the Price of Wheat, 1872-1913." *Journal of Economic History* 38 (1978): 865-78.
- . "Transportation, the World Wheat Trade, and the Kuznets Cycle, 1850-1913." *Explorations in Economic History* 17 (1980): 218-50.
- Hibbard, Benjamin H. *A History of the Public Land Policies*. New York: Macmillan, 1924.
- Higgs, Robert. "Railroad Rates and the Populist Uprising." *Agricultural History* 44 (1970): 291-97.
- Kendrick, John W., and Maude R. Pech. *Productivity Trends in the United States*. National Bureau of Economic Research General Series 71. Princeton: Princeton University Press, 1961.
- Lindert, Peter. "Long-Run Trends in American Farmland Values." *Agricultural History* 62 (1988): 45-86.
- Mayhew, Anne. "A Reappraisal of the Causes of Farm Protest in the United States, 1879-1900." *Journal of Economic History* 32 (1972): 464-75.
- McGuire, Robert. "Economic Causes of Late Nineteenth Century Agrarian Unrest: New Evidence." *Journal of Economic History* 41 (1981): 835-52.
- North, Douglass C. *Growth and Welfare in the American Past: A New Economic History*. Englewood Cliffs, N.J.: Prentice-Hall, 1966.
- Parker, William N., and Judith L. V. Klein. "Productivity Growth in Grain Production in the United States, 1840-1860 and 1900-10." In National Bureau of Economic Research, *Output, Employment, and Productivity in the United States after 1800*, Studies in Income and Wealth, vol. 30. New York: Columbia University Press, 1966: 523-80.
- Rothstein, Morton. "America in the International Rivalry for the British Wheat Market, 1860-1914." *Mississippi Valley Historical Review* 47(1960): 401-18.

- Saloutos, Theodore. "The Agricultural Problem and Nineteenth-Century Industrialism." *Agricultural History* 22 (1948): 156-74.
- Stock, James H. "Real Estate Mortgages, Foreclosures, and Midwestern Agrarian Unrest, 1865-1920." *Journal of Economic History* 44 (1984): 89-105.
- Williamson, Jeffrey G. "Greasing the Wheels of Sputtering Export Engines: Midwestern Grains and American Growth." *Explorations in Economic History* 17 (1980): 189-217.
- Wright, Gavin. "American Agriculture and the Labor Market: What Happened to Proletarianization?" *Agricultural History* 62 (1988): 182-209.