TIME ON THE LADDER:
CAREER MOBILITY IN AGRICULTURE, 1890-1938

Lee J. Alston
Joseph P. Ferrie

Time on the Ladder: Career Mobility in Agriculture, 1890-1938
Lee J. Alston and Joseph P. Ferrie
NBER Working Paper No. 11231
March 2005
JEL No. N3, N5, J6

ABSTRACT

We explore the dynamics of the agricultural ladder (the progression from laborer to cropper to renter) in the U.S. before 1940 using individual-level data from a survey of farmers conducted in 1938 in Jefferson County, Arkansas. Using information on each individual's complete career history (their tenure status at each date, in some cases as far back as 1890), their location, and a variety of their personal and farm characteristics, we develop and test hypotheses to explain the time spent as a tenant, sharecropper, and wage laborer. The pessimistic view of commentators who saw sharecropping and tenancy as a trap has some merit, but individual characteristics played an important role in mobility. In all periods, some farmers moved up the agricultural ladder quite rapidly while others remained stuck on a rung. Ascending the ladder was an important route to upward mobility, particularly for blacks, before large-scale migration from rural to urban places.

Lee J. Alston
Department of Economics
Institute of Behavioral Science
University of Colorado at Boulder
483 UCB
Boulder, CO 80309-0483
and NBER
lee.alston@colorado.edu

Joseph P. Ferrie
Department of Economics
Northwestern University
Evanston, IL 60208-2600
and NBER
ferrie@northwestern.edu

I.   INTRODUCTION

Tenancy has been a prominent feature of agriculture since before the Roman Empire. Yet

we know little about the dynamics of the mobility that individuals experience as they move

among tenure classes. What makes it easier for a wage worker or sharecropper to become a

renter? How likely were renters to fall in status and become sharecroppers or laborers? And how

long did movement up the farm hierarchy take? Though we now know a great deal about tenancy

from cross-sectional studies, little is known about its role in the careers of individual farmers.

This study provides longitudinal evidence for Southern Black farmers in the early twentieth

century and offers a glimpse at the forces shaping their career paths.

A better understanding of the forces shaping mobility in agriculture will produce several

benefits. The first is a more realistic picture of the experience of individual farmers. For

example, one of the problems associated with tenancy is inadequate attention to the long-run

viability of the land if they are short-term renters rather than long-term tenants or owners. If

tenants expect a long tenure as a residual claimant their incentive to mine the soil is reduced.[1]

More importantly without data on individual farmers it is impossible to account for the

unobserved characteristics of farmers (e.g. ability, entrepreneurship and willingness to work).

A better understanding of the extent of tenure mobility can also shed light on views

toward redistributive policies. Americans may accept greater income inequality than Europeans

because of a perception in the United States that individuals are more likely than Europeans to

increase their income or otherwise improve their status over time.[2] In societies where there is

little mobility up the tenurial ladder, the electorate tends to support land reform efforts and other

---

[1] We explore the issue of stasis for tenants and sharecroppers but not for owners. For owners we will explore this
issue in greater detail in future work using the 25,000 surviving schedules from the 1920 Agricultural Census in
Alston and Ferrie, "Farm Tenure."
[2] On the trade-off between mobility and redistribution, see the review by Putterman, Roemer, and Sylvestre (1996).

political interventions in land markets. For example, one of the turning points in Argentine history was imposition of rent controls in the Pampas in the 1940s (Alston and Gallo, 2004). In short, the United States has been (and is) perceived as the "land of opportunity." This popular notion has much anecdotal support but it is difficult to test.[3] The notion of the U.S. as a land of opportunity came under attack in the early twentieth century as the agricultural sector suffered through two decades of high farm failures in the 1920s and 1930s.[4] We will assess the causes of mobility in agriculture at the individual-level and how the "boom" years surrounding the First World War, and the "bust" years of the interwar period and Great Depression affected mobility. Our analysis will focus on black farmers, most of whom worked on plantations. To the extent that this group of farmers experienced upward mobility during a time of extreme legal and social discrimination, we can only infer that the "average American" fared better.

Finally, knowing more about career mobility in farming will contribute to our understanding of the geographic and occupational mobility of Americans more generally. Studies of occupational mobility have focused on urban settings where movement from worse to better occupations is easy to identify. But until 1920, more Americans lived in rural places than in urban ones, and even as late as the 1940s agriculture accounted for nearly a quarter of the employed labor force.[5] We know little about how much improvement people could expect when they remained in the farm sector, though that expectation no doubt shaped their decisions regarding movement from farms to towns and cities. Though this geographic movement was dramatic in the case of some groups (such as blacks), we know far more about the circumstances they faced in the urban places to which they moved than about the opportunities for advancement

---

[3] For an attempt to assess the link between perceptions of social mobility and preferences for redistributive policies, see Alesina and La Ferrara (2001). For evidence on changes in occupational and wealth mobility in the U.S. since the 1850s, see Ferrie, "The End of American Exceptionalism."

[4] On the magnitude and causes of farm distress in the interwar period, see Alston (1983).

[5] *Historical Statistics of the U.S.*, Series D 1-10.

(or the lack of such opportunities) in the rural places they left. An understanding of the dynamics of the agricultural ladder will tell us more about the circumstances faced at their point of origin by the millions who abandoned farming for urban pursuits in the first decades of the twentieth century.

The occupational changes we observe were quantitatively important as a route to upward mobility, before large-scale migration from rural to urban places. The mobility experienced in agriculture compares favorably to both the extent of mobility seen in the general economy before the Depression and the extent of mobility among males today, particularly for blacks. In the data we describe below, 39 percent of males who were farm laborers or sharecroppers in their twenties (almost all of whom were black) had become tenants or owners over the next ten years – an improvement in their income and autonomy comparable to a change from unskilled to skilled or white collar work in the non-farm population. Among unskilled males in their twenties in 1920 in the general population, 53 percent had obtained skilled or white collar jobs by 1930 (55 percent for whites, 38 percent for blacks). Between 1971 and 1981, 44 percent of unskilled males in their twenties rose into a skilled or white collar job (50 percent for whites, 32 percent for blacks).[6]

II.   THE FARM TENANCY "PROBLEM" IN THE 20TH CENTURY U.S.

> Movement from rung to rung has been predominantly in the direction of descent rather than ascent…[There is] an increasing tendency for the rungs of the ladder to become bars—forcing imprisonment in a fixed social status from which it is increasingly difficult to escape.
>   National Resources Committee, *Report of the President's Committee on Farm Tenancy* (1937)

---

[6] Mobility from 1920 to 1930 was calculated with a random sample of 515 males age 20 to 29 in 1920 linked from the 1920 One Percent U.S. Census of Population Public Use Sample to the manuscript schedules of the 1930 U.S. Census of Population. Mobility from 1971 to 1981 was calculated using 793 males age 20 to 29 in 1971 drawn from the National Longitudinal Survey Young Male cohort. See Ferrie, "Economic Mobility."

Though tenancy rates had been climbing consistently from the late nineteenth century, the distress in the agricultural sector in the 1920s and 1930s provoked alarm among social commentators and policymakers. They feared that the U.S. was becoming a country of absentee farm owners. There was considerable variation across regions, with tenancy remaining low in the Northeast while reaching 42% in the South by 1930.[7] The concern over tenancy prompted numerous reports in the 1920s by researchers in the U.S. Department of Agriculture. Analysts in the 1920s generally reached sanguine conclusions regarding tenancy and the prospects for farmers to ascend the agricultural ladder from wage worker to sharecropper (a rung only in the South) to tenant to owner.[8]

In the 1930s the reviews of tenancy were mixed. The *Report of the President's Committee on Farm Tenancy* in 1937, quoted above, was the most alarmist. The President's report, in turn, stimulated research on the causes of farm tenancy. Most notable among the research efforts were: "The Growth of Farm Tenancy in the United States" (1937) by John D. Black and R.H. Allen, and "Social Status and Farm Tenure – Attitudes and Social Conditions of Corn Belt and Cotton Belt Farmers" (1938) by E.A. Schuler, writing under the auspices of USDA, the Farm Security Administration, and the Bureau of Agricultural Economics. Black and Allen attributed a large part of the rise in tenancy to the increased use of croppers instead of farm laborers in the South.[9]

---

[7] The U.S. census defined tenancy rates as the number of sharecroppers plus share and fixed rent tenants as a percentage of the number of operators, defined as the number of sharecroppers, share and fixed renters plus owners. The census did not include wage workers as part of farm operators. In our tenancy figures in the text we exclude sharecroppers because of our belief that sharecroppers were more akin to wage workers than tenants. If we include sharecroppers as tenants the percentage of tenancy in the South reached 56% in 1930. See Alston and Kauffman (1997) for estimates of croppers in 1900 and 1910 and revised estimates of "true tenancy."

[8] See for example the excellent studies by L.C. Gray *et al.* (1924) and E.A. Goldenweiser and Leon E. Truesdell (1924).

[9] Most scholars in the 1920s and 1930s were well aware of the important distinction between croppers and tenants. The census continued to consider croppers a subgroup of tenants, "yet nothing could be more misleading than such a grouping." [Brandt (1938), p. 24].

Consistent with the economists in the USDA in the 1920s, both Black and Allen and Schuler believed that to understand the tenancy issue required looking at all the rungs of the agricultural ladder (wage laborer, cropper, tenant, and owner) and then assessing the causes of movements up, down, and off the ladder. On the basis of census data (or at times educated guesswork), Black and Allen reached several conclusions: 1) the rate of ascent on the agricultural ladder was relatively constant over the first three decades of the twentieth century, but entrants started at lower rungs over time; 2) there was considerable variation across regions (mostly accounted for by differences in crops) in the number of farmers on each rung; 3) prosperity (1900-1920) or depression (the 1890s and the interwar period) were major determinants of the number of farmers on each rung; and 4) croppers were on the decline in the 1930s as a result of tractorization, relief work, and the policies of the Agricultural Adjustment Acts. Black and Allen had to rely on their intuition for several of their conclusions because the Census has never systematically collected data on full-time laborers. This issue has hampered research on the agricultural ladder because changes in tenancy (including sharecroppers) could result from either movements out of or into the wage labor category or movements into or out of the ownership category. On these movements rest many welfare implications concerning not only the farm sector in the historical U.S. but also in developing and transition economies.

Schuler more systematically addressed the tenancy question through a survey in 1938 of 2,700 farmers in two of the major farming regions in the U.S., the cotton and corn belts. The surveys produced occupational and locational histories of the farmers along with individual characteristics of the farmers: year and place of birth, father's tenure status, years of schooling, age at leaving home, years and amounts of any inheritance, marital status, and relationship to the landowner. By looking at aggregated regional averages and using bivariate ocular regression

5

techniques (i.e., eyeballing the data), Schuler reached several general conclusions: 1) there was considerable variation across regions and between races in movements up and down the agricultural ladder; 2) inheritance caused a substantial boost up the agricultural ladder; and 3) education provided more of a boost for black southern farmers than for northern or southern white farmers.

Prior to Schuler, L. C. Gray *et al.* (1924) addressed the issue of farm mobility. Using data from the 1920 Census of Agriculture, the authors found that for the U.S. as a whole, 42% of farmers who became tenants between 1915 and 1920 had previously worked for wages, while 47% started their careers as tenants [Gray *et al.* (1924): 553-554]. The percentage of tenants who never worked for wages was much higher in the South because of the census classification of croppers as tenants. Consistent with this interpretation, Gray *et al.* found that the average ages at which farm laborers became farm tenants was lowest in the South, though counting croppers as tenants. They also found signs of falling down the agricultural ladder: in 1920 for the U.S. as a whole, eleven percent of farm tenants had once been owners. This fraction was as high as one-third in some of the Rocky Mountain and desert states [Gray *et al.* (1924): 556]. The authors also track the length of time spent at various rungs on the agricultural ladder prior to reaching ownership. Typically, the longer a state had been occupied, the longer it took to become an owner. The authors caution not to attach welfare implications to the varying periods of time it takes to reach ownership. They argued that several factors account for the increase in tenancy: time spent in education prior to farming, different capital requirements, and different age structures of the resident population.

III. JEFFERSON COUNTY AS REPRESENTATIVE OF THE COTTON REGION

In our own work we can better assess the determinants of movements on the agricultural ladder than our predecessors could in the 1920s and 1930s, or our contemporaries can today.[10] Our approach relies on the 227 extant manuscripts for Jefferson County, Arkansas from the larger study produced by Schuler in 1938 for the Farm Security Administration.[11] Fortunately, we are able to reach general conclusions about tenure mobility because Jefferson County appears quite representative of the cotton South.

Jefferson County is located just southeast of the center of Arkansas (at 34.26° north latitude, 91.92° west longitude. The county was established in 1829 and was, as early as the 1830s, recognized as extremely productive land for cotton cultivation.[12] Figure 1 shows the location of Melton Township, the area sampled by Schuler in Jefferson County. It lies roughly 20 miles southeast of Pine Bluff, the county seat, below the Arkansas River which bisects the county, in alluvial lowlands, "comprised of soils and silt, etc. . . . very fertile and adaptable to cultivation."[13]

The county as a whole, but particularly the portion of it containing Melton Township, is quite representative of the Cotton Belt. Figures 2 through 5 compare Jefferson County's characteristics to those of counties in Arkansas, Texas, Louisiana, Mississippi, Alabama, and Georgia. In most respects (racial make-up, tenancy and crop value in cotton), Jefferson County

---

[10] The best treatment of movement on the ladder is the work of Atack (1988 and 1989) but Atack was forced to draw inferences from cross-sectional data.

[11] The schedules are located in the Rare Books and Manuscripts Division of the University of Arkansas Library at Fayetteville, in the records of the University's Department of Agricultural Economics and Rural Sociology.

[12] The county's early agricultural and commercial histories are summarized in Betty Hollis Garman, "An Economic History of Jefferson County, Arkansas, From Reconstruction through World War I," *Jefferson County Historical Quarterly* (1981).

[13] The county's characteristics are described in detail in the Federal Writers Project county history available at the Pine Bluff – Jefferson County Public Library (Jefferson County, Ark., History, compiled by the Federal Writers Project of the Works Progress Administration for the State of Arkansas, n.d., n.p.).

Figure 1

Melton Township and Jefferson County Arkansas

lies in the same quartile of the distribution as other counties in the Yazoo-Mississippi Delta and

in the Cotton Belt. Researchers in the 1920s and 1930s recognized that Jefferson County was

representative of the South's Delta cotton plantation areas: a 1937 survey of Arkansas cotton

plantations includes several units in the portion of Jefferson County containing Melton

Township, while an examination of land tenure in Arkansas groups Jefferson County with "Delta

type" counties along the Mississippi and lower Arkansas rivers.[14]

Only in the fraction of its labor force engaged in farming (Figure 2) does Jefferson

County differ substantially from these places. This reflects the presence of several industries that

provided off-farm employment. As early as 1859, Jefferson County "was one of the most

important manufacturing counties in the state," with most of this activity occurring in Pine

---

[14] H.W. Blalock, "Plantation Operations of Landlords and Tenants in Arkansas," Agricultural Experiment Station Bulletin, No. 339, University of Arkansas College of Agriculture (Fayetteville, 1937); and J.A. Baker and J.G. McNeely, "Land Tenure in Arkansas."

Figure 2

Percent of Labor Force in Farming, 1940

Jefferson County, AR

1. above 80%   2. 70-80%   3. 50-69%   4. below 50%
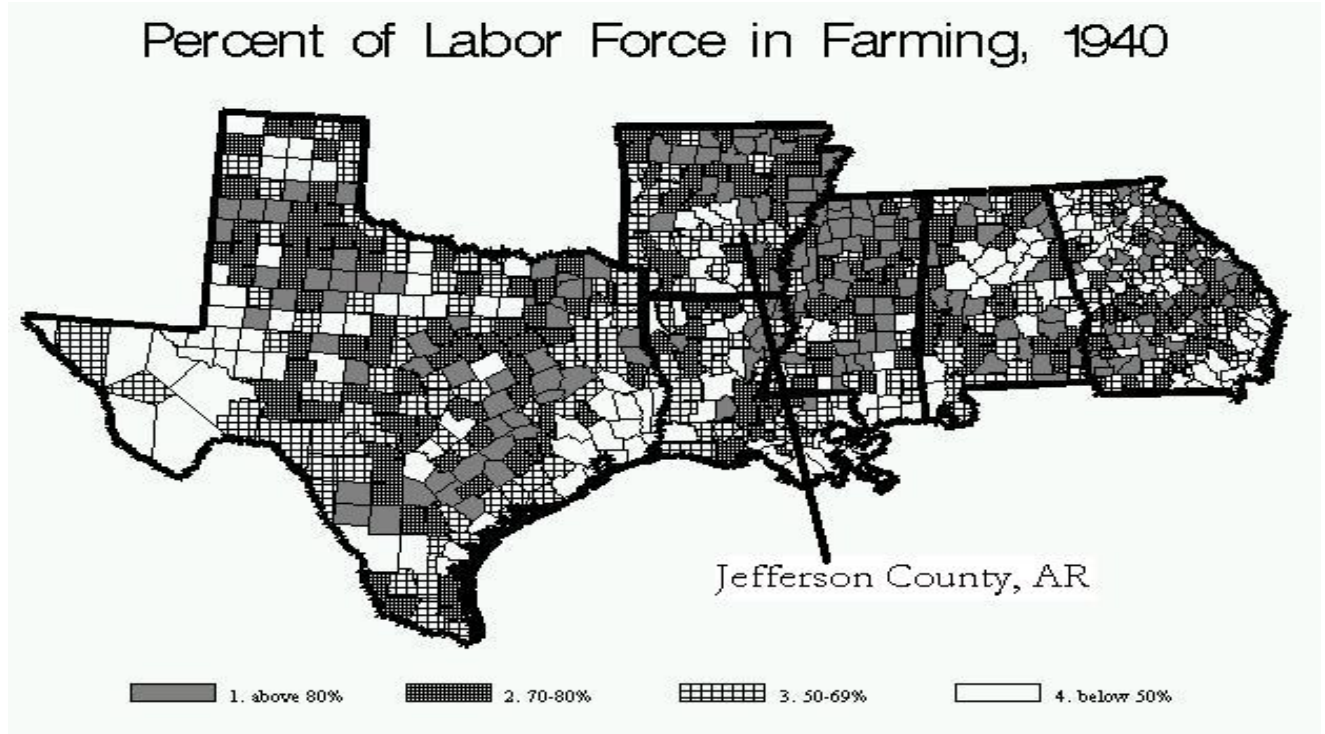
Bluff.[15] In June, 1935, Pine Bluff had forty-seven large manufacturing firms and thirty five

smaller industrial plants.[16] These included lumber mills manufacturing oak flooring, firms

manufacturing brakes and bodies for automobiles, and cotton oil mills.[17] The impact of these off-

farm employment opportunities on our analysis of mobility up and down the agricultural ladder

is likely to increase the amount of time that farmers spend in employment outside agriculture

during their careers, compared to other Cotton Belt counties. It is impossible to determine the

direction of the bias this imparts to our measures of upward and downward movement along the

agricultural ladder without knowing how agricultural and industrial employment were correlated

and whether the same individuals who did best in farming were also those with the skills to fare

best in manufacturing.

---

[15] Federal Writers Project (n.p.).
[16] Federal Writers Project (n.p.).
[17] Pine Bluff Chamber of Commerce, Report on the Industrial Survey of Pine Bluff, Arkansas (Pine Bluff, 1926).

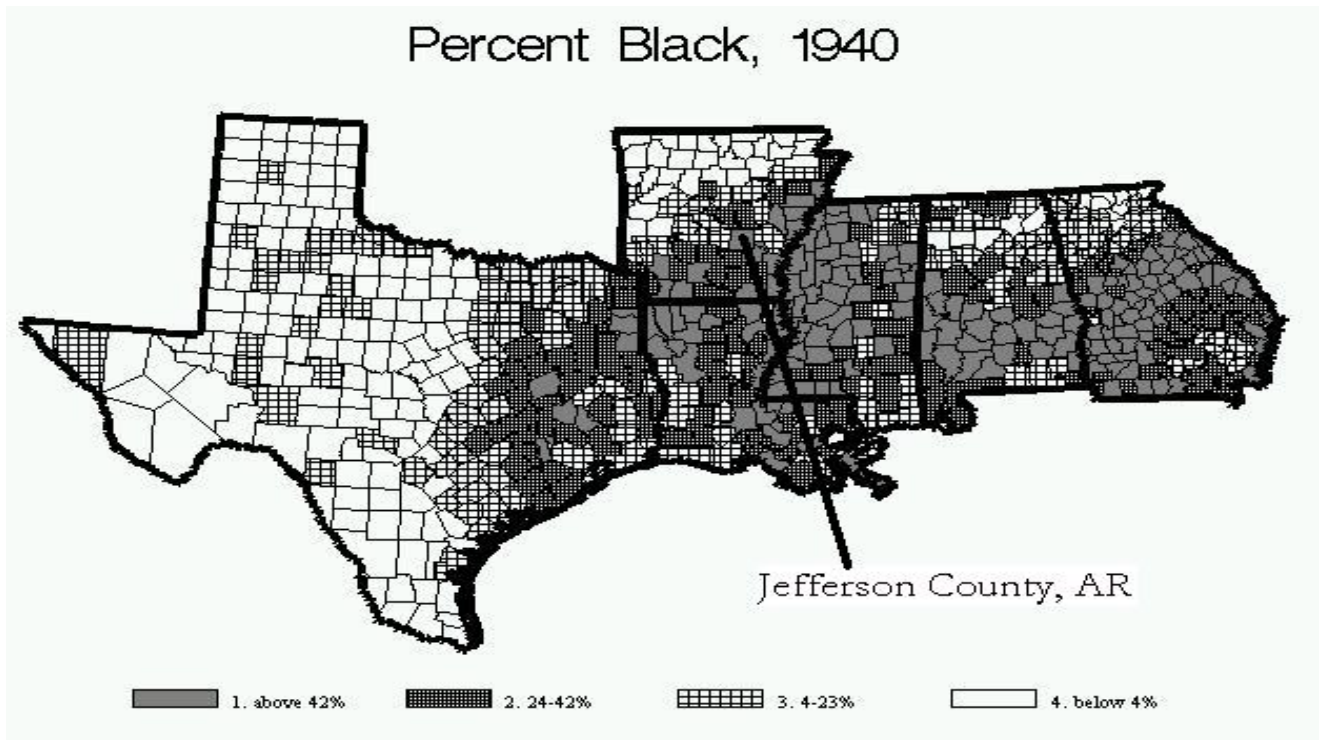**Figure 3**

Percent Black, 1940

Jefferson County, AR

1. above 42%   2. 24-42%   3. 4-23%   4. below 4%

Figure 4

Pct. Farms Oper. By Tenants & Croppers, 1939

Jefferson County, AR

1. above 62.7%   2. 51.4-62.7%   3. 41.9-51.3%   4. below 41.9%

Figure 5

Percent of Crop Value in Cotton, 1929

Jefferson County, AR

1. above 69%   2. 51-69%   3. 21-50%   4. below 21%
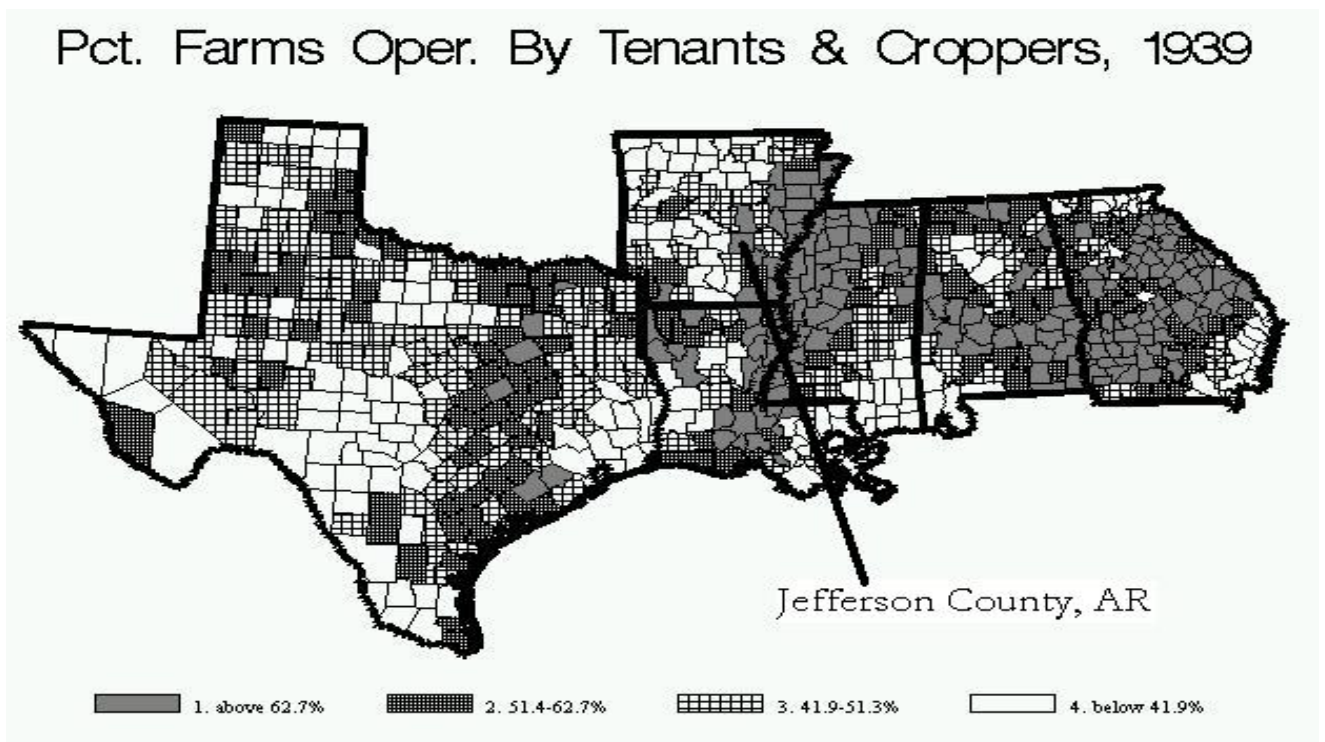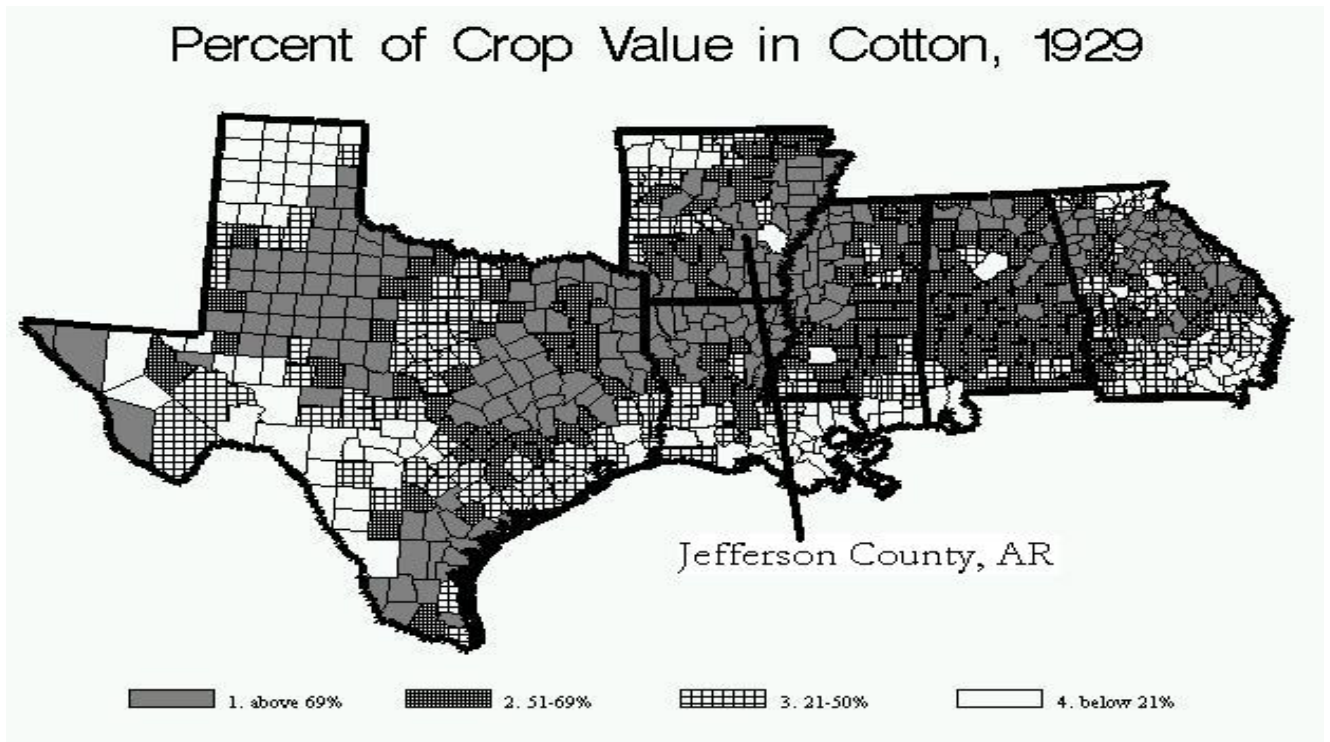
In Table 1, we compare the characteristics of farmers in our sample to all the farms in Jefferson County and to all the farms in Arkansas. In most respects, the sample straddles the data for the county and the state. This is the result of the sampling strategy used by Schuler's team: it sought responses from tenure classes that corresponded to the shares of those classes engaged in cotton farming.

Table 1
Characteristics of the Sample, Jefferson County, Arkansas, and the Cotton Belt, 1930

	Sample	Jefferson County	Arkansas
Avg. Farm Size (acres)	52.6	42.8	66.2
Avg. Improved Land (acres)	41.1	27.5	32.6
Avg. Value of Land & Bldgs.	$2,037.0	$1,926.0	$2,260.0
Tenure Status (percent)			
Owners	26.0	17.4	40.0
Renters	26.0	22.9	34.1
Croppers	48.0	59.7	25.9

Source: Sample (see text) and U.S. Census Bureau, *Fifteenth Census of the U.S.* (Washington, D.C., 1932).

We can also compare our sample to the U.S. Census Public Use Samples for Jefferson County for the period 1900 to 1920 (Table 2). Except for percent born out of state, our sample matches up fairly well with the census data. This is important because the data in the Schuler study were collected retrospectively, so only those still in agriculture in 1938 could have their agricultural career histories recorded. For example, a farmer who began farming in 1910, but who had moved out of agriculture by 1930 would not show up in Schuler's data. If the characteristics of those in the Schuler data at census dates in the past are similar to those in the county population generally at those dates, then we can have some confidence that the retrospective nature of the survey is not causing us to miss farmers "falling off" the agricultural ladder who differ systematically from those who remained on the ladder and whom we can observe. The close correspondence between the Schuler data in 1900, 1910, and 1920 and the population of the county's farmers at those dates suggests that this bias is not substantial.

Table 2
Comparison of Male Farm Household Heads in U.S. Census Public Use Samples for Jefferson County and Sample, 1900-1920

	1900	1910	1920
Percent Black			
County	87.5	85.0	83.3
Sample	100.0	90.2	87.7
Ratio	0.9	0.9	0.9
Percent Born Out of State			
County	62.5	45.0	42.4
Sample	13.0	17.7	21.0
Ratio	4.8	2.5	2.0
Age			
County	43.2	37.2	41.0
Sample	28.0	33.8	39.3
Ratio	1.5	1.1	1.0
Percent Married			
County	90.0	100.0	97.0
Sample	91.3	92.2	95.1
Ratio	1.0	1.1	1.0
N			
County	40	20	66
Sample	23	51	81

The cross-sectional characteristics of the Schuler data for Jefferson County are thus

reasonably representative of the counties in the Delta where plantation cultivation of cotton was prevalent. The longitudinal characteristics of the Jefferson County data also point to its representativeness. When career mobility among tenure classes in our sample data from Jefferson County is compared in Table 3 to tenure mobility for the entire South in Schuler's published tables, it is clear that Jefferson County looks much like the rest of the cotton regions in the South. For example, in both Jefferson County and in the whole South, 85 percent of those who started their careers as owners remained owners at the end of their careers, while just under a third of those who started as renters ended up in a higher status (as owners).

Table 3
First vs. Last Tenure Status

	South (1938) First Status			Jefferson County (1938) First Status		
Last Status	owner	renter	cropper	owner	renter	cropper
higher	–	31.9	39.0	–	32.5	26.8
same	85.4	55.1	55.0	85.2	47.5	59.0
lower	14.6	13.0	6.0	14.8	20.0	14.2
N	247	477	723	27	40	134

Source: South from Schuler (1938); Jefferson County from sample (see text).

An unpublished survey by Harold Hoffsommer in 1933 provides an additional comparison. Hoffsommer examined the careers of nearly a thousand Alabama farmers. His results are compared in Table 4 to those from Jefferson County. In both samples, roughly 45

Table 4
First vs. Last Tenure Status

	Alabama (1933) First Status			Jefferson County (1938) First Status		
Last Status	owner	renter	cropper	owner	renter	cropper
owner	14.6	2.8	5.8	12.9	7.3	6.2
renter	2.7	11.1	11.4	1.7	10.7	14.0
cropper	1.4	4.8	45.7	0.6	2.3	44.4
N		982			178	

Source: Alabama from Hoffsommer (1933); Jefferson County from sample (see text).

percent of farmers started and ended their careers as croppers, while about six percent began as

croppers and moved up to ownership over their careers. Eleven percent rented throughout their careers.

IV.   DETERMINANTS OF MOBILITY ON THE AGRICULTURAL LADDER

For agriculture, ascension on the ladder is a good indicator of economic mobility because as workers ascend, their incomes increase.[18] For example, Blalock (1937) reports average net income in 1934 for agricultural workers in the Arkansas River plantation region of $226 for wage workers, $233 for sharecroppers, and $386 for tenants. These figures include adjustments for "home use products." The income of wage laborers and sharecroppers was thus similar, but the step up to tenant represented an income increase of 66%. The real earnings of wage laborers and sharecroppers compare favorably to wages received by unskilled workers in manufacturing until 1933 when New Deal policies boosted relative manufacturing wages, though at the expense of increased urban unemployment.[19] In income terms, the step up to tenant was similar to moving from the unskilled to the skilled category in manufacturing.

The theoretical underpinnings of the agricultural ladder are similar (and indeed intellectually prior) to the underpinnings of the age-earnings profile used in labor economics. Over time workers acquire both human and physical capital enabling them to ascend the ladder, which is akin to a promotion in pay and status. Along the career trajectory exogenous events such as wartime prices or depressions can cause ascents or descents from one tenure category to another. Equally important are individual characteristics such as thrift, luck or hard work. In addition, an inheritance can quickly bounce a farmer up the ladder to tenant or owner.

---

[18] Incomes increase for two reasons: farmers take on more risk and hence need to be compensated; and the incentive for landlords to monitor workers decreases and workers capture some of the decrease in monitoring costs in higher incomes.

[19] For estimates of the earnings gap between agricultural and manufacturing laborers for 1925 to 1941, see Alston and Hatton (1991).

Rather than presenting an overarching theoretical framework for tenure mobility, we will develop hypotheses for the dynamics of tenure mobility in the early part of the twentieth century though our hypotheses have relevance for tenure mobility in other times and places. The literature on agricultural tenancy broadly speaking focuses on transaction cost and risk.[20]

Transaction cost determinants of contract form generally fall into the categories of supervision and enforcement costs. Our measures for supervision costs and enforcement costs include individual-level measures for age, education, inheritance and the cohort effects of war and depression. Before conducting empirical tests we will flesh out the roles of supervision and enforcement costs in tenure mobility.

Supervision Costs

As farmers ascend the agricultural ladder, landlords have a decreasing need to supervise the labor effort of farmers. As labor moves from wage worker to cropper to tenant and ultimately to ownership, the share of net output going to the operator increases, which increases the incentive for work effort. The contractual form chosen will be closely related to the incentive for the landowner to monitor work effort. It is not only labor effort in the fields that needs to be monitored. Individuals have an incentive to monitor the use of all assets that they bring to the production process, though labor-monitoring costs can be considered a residual to the monitoring of the other assets.[21]

Consider the following simplified production process for cotton. Output is a function of land (quantity and quality), physical capital (a mule or horse or tractor), human capital of the

---

[20] We will not directly test for the importance of risk but tangentially will do so through cohort effects. For a discussion of the role of risk in agricultural contracts, see Allen and Lueck (1999). They find little evidence for the role of risk in shaping tenancy arrangements.

[21] If one farmer supplies all inputs to the production process, then all costs of stinting or abuse are internalized so monitoring costs disappear.

farm owner and operator, labor effort, and uncertain weather.[22] We assume that the market for

inputs is competitive and endowments vary across farmers (e.g., some farmers have land and

mules and are looking to hire labor, and some laborers have farm experience and mules and are

searching for land). How do suppliers and demanders of inputs match up? This is best illustrated

with an example. Suppose a resident farm owner with considerable farming experience and a

mule is looking for a laborer. He is willing to supply all the inputs except labor effort. Given his

endowment, what would be the best match? He would search for a laborer who has no capital

and little farming experience. In this way, he would get the best return on his human and

physical capital. In this situation, the landowner has an incentive to be in the fields to monitor his

physical capital (the mule in particular) to prevent its depreciation, and to furnish directions

(human capital). Given the presence of the landlord for these reasons, the marginal cost of

monitoring labor effort is low; there are economies of scope in monitoring.[23] When workers are

endowed with more physical or human capital, the landlord cannot benefit from such economies

of scope; as a result the direct costs of monitoring the labor effort of these workers is greater than

for workers with less capital. To reduce the costs of monitoring better-endowed workers,

landlords will negotiate contracts higher on the agricultural ladder. Similarly if certain crops are

more soil-depleting (e.g., row crops compared to grain crops), then owners will have an incentive

to limit output. One mechanism is to negotiate more share relative to fixed-rent contracts because

the tenant will have less incentive to maximize short-run yields at the expense of long-run soil

fertility.[24]

---

[22] In the absence of weather-related shocks that produce uncertain effects on output, landlords could presumably measure labor effort by observing output and reward or punish workers accordingly. It is the uncertainty of the impact of the shock on output that prevents contingent contracting.

[23] Alston and Higgs (1982) developed the hypotheses about economies of scope in monitoring. Similar to Alston and Higgs, Eswaran and Kotwal (1985) provide an endowment model of managerial ability to explain the mix of contracts – fixed-wage, share, and fixed-rent.

[24] Allen and Lueck (1992) found evidence consistent with this hypothesis.

An important means of acquiring physical capital is an inheritance. An inheritance could enable a worker to purchase a mule, thereby increasing the likelihood of being a tenant, or if the inheritance is more substantial it may enable a tenant to purchase a farm and ascend to the owner rung.

From our data we can construct several proxies for the human and physical capital of workers. We have the following measures of human capital: age, marital status, schooling, years on farm, and years in the county. Workers who are older, married, better schooled, longer on their present farm, or longer in the county or state should be at higher rungs on the agricultural ladder. For the physical capital of workers and landlords, we have the year and amount of any inheritances. To the extent workers possess greater capital, they should be on higher rungs.

Enforcement Costs

Enforcement costs of labor effort result from efforts to ensure an adequate labor supply during peak demand, which for cotton is the harvest. During peak demand, piece rates and day wages increase giving an incentive for some workers to abandon their current employment. Higher tenure status decreases the incentive for abandonment because higher tenure status brings with it expected higher post-harvest remuneration. The enforcement costs to landlords increase as labor becomes scarcer. As such, boom times (e.g., the war years), should be associated with ascension up the agricultural ladder and conversely depression years should be associated with movements down the ladder.[25] The war years brought boom times to agriculture until prices fell drastically, beginning in July 1920. The bust in prices brought unparalleled levels of farm failures during subsequent inter-war years.

Prosperity on the farm should affect all rungs of the ladder. Prosperity should enable

---

[25] Ideally, one would control for the independent effect of gains or losses of physical capital but we can do so only through inheritance.

wage workers and croppers to accumulate the capital necessary to become tenants. On the other hand farm distress in the form of farm foreclosures affects primarily the highest levels of the tenure ladder. When foreclosure rates are high, we should see some of our owners fall to the tenant rung or at times all the way to wage laborer. Correspondingly, high foreclosure rates bring low farm prices and some of our tenants may ascend to the ownership rung. Similarly, for tenants a bad year may entail having to sell a mule and falling to the cropper rung, while for croppers, depressed mule prices may enable some to climb to the tenant rung. Whether falling down or rising up the agricultural ladder dominates is an empirical question. With our sample from Jefferson County we will be able to compare the time spent as a wage earner or cropper compared to time as a tenant for good and bad years.[26]

Another enforcement cost issue is the potential for underreporting of output. Allen and Lueck (1999) argue that yield variability affects the ability of share tenants to cheat landlords by underreporting the output. As such, they expect to observe more fixed-rent contracts where yields are more variable. Though we do not dismiss this as a possible factor affecting tenure category we will control for it by the nature of holding crop constant and combining fixed-rent and share tenants.[27] Additionally, underreporting cotton is more difficult than underreporting other crops because of ginning at a central location.

V.   ANALYSIS OF THE DYNAMICS OF THE AGRICULTURAL LADDER

In our analysis, because we have too few observations on whites and owners we focus on only black workers who started their agricultural careers as wage workers, sharecroppers, or tenants. The Schuler sample for Jefferson County is overwhelmingly black (85%), reflecting the

---

[26] Alston (1981) found that wage contracts were more prevalent in regions with a more abundant supply of farm labor.

[27] Higgs (1974) found that risk was a primary factor explaining the cross-state variation in the use of fixed-rent and share tenant contracts.

dominance of plantation farming in Melton Township. During the period we examine, blacks in

the South faced overt social and legal discrimination.[28] To the extent that we find mobility, it is

testimony to the hard work of individuals within a competitive market environment.[29] Our

sample consists of individuals who have 3,627 opportunities for ascent or descent from year to

year. In Table 5 we show the yearly movements from rung to rung. Overall, stasis is the most

likely outcome. Wage workers are the most mobile with 12% moving yearly to the sharecropper

rung, 3% to tenancy, and 1% to ownership. Sharecroppers are more likely to move up than down

the ladder: 1.4% of the yearly movement is into the wage category and 5% is into tenancy or

ownership. This is somewhat surprising given that 25% of our moves are in depression years.

Though 94% of the possible movement for tenants is stasis, the downward mobility to

sharecropper or wage is about 2.5% points greater than the upward movement to ownership.

Because 44% of the possible moves for all categories are from the sharecropper rung, upward

mobility exceeded downward mobility overall.[30] Stasis from year to year and particularly over

Table 5
Status at time t+1 by Status at time t

Status at time t	Status at time t+1				
	Laborer	Cropper	Tenant	Owner	Total
Laborer (N)	700	104	24	9	837
as a fraction of all at t	83.63	12.43	2.87	1.08	100.00
as a fraction of all at t+1	95.89	6.33	1.97	25.00	23.08
Cropper (N)	22	1495	71	7	1595
row percent	1.38	93.73	4.45	0.44	100.00
column percent	3.01	90.94	5.83	19.44	43.98
Tenant (N)	8	45	1122	20	1195
row percent	0.67	3.77	93.89	1.67	100.00
column percent	1.10	2.74	92.19	55.56	32.95
Total (N)	730	1644	1217	36	3627
row percent	20.13	45.33	33.55	0.99	100.00
column percent	100.00	100.00	100.00	100.00	100.00

---

[28] See Alston and Ferrie (1999).
[29] Our interpretation of our findings parallels that of Higgs (1977) for the period 1865-1914.
[30] These micro results are consistent with the finding of overall ascension for the period 1900-1930 reached by Alston and Kauffman (1997 and 1998).

longer periods suggests that mining the soil would not be wealth maximizing strategy for sharecroppers and tenants.

In Table 6 we present descriptive statistics for the sample that we use in our regression analysis. Wage workers tend to be younger than sharecroppers or tenants but there are large standard deviations. There is considerable variation across our sample individuals in time spent

Table 6
Descriptive Statistics by Status at Time *t-1*

Variable & Status at *t-1*	Obs	Mean	Std. Dev	Min	Max
All					
Age	3627	32.7778	13.4697	15	75
War (1917-20)	3627	0.0954	0.2938	0	1
Interwar (1921-29)	3627	0.2479	0.4318	0	1
Depression (1930-37)	3627	0.2492	0.4326	0	1
Years in Status	3627	7.8795	9.0358	0	46
Schooling	3627	4.2131	2.5982	0	14
Inheritance	3627	0.6686	33.6221	0	2000
Laborer					
Age	837	22.1458	10.1962	15	65
War (1917-20)	837	0.0944	0.2925	0	1
Interwar (1921-29)	837	0.2127	0.4094	0	1
Depression (1930-37)	837	0.1888	0.3916	0	1
Years in Status	837	3.9737	6.3021	0	46
Schooling	837	4.5842	2.4371	0	14
Inheritance	837	2.5090	69.2123	0	2000
Cropper					
Age	1595	34.4251	12.9878	15	75
War (1917-20)	1595	0.0859	0.2803	0	1
Interwar (1921-29)	1595	0.2627	0.4402	0	1
Depression (1930-37)	1595	0.3116	0.4633	0	1
Years in Status	1595	8.3712	8.8016	0	45
Schooling	1595	3.7367	2.5628	0	14
Inheritance	1595	0.2038	7.5374	0	300
Tenant					
Age	1195	38.0259	11.9401	15	70
War (1917-20)	1195	0.1088	0.3115	0	1
Interwar (1921-29)	1195	0.2527	0.4348	0	1
Depression (1930-37)	1195	0.2084	0.4063	0	1
Years in Status	1195	9.9590	10.0682	0	46
Schooling	1195	4.5891	2.6520	0	14
Inheritance	1195	0.0000	0.0000	0	0

Note: The sample is restricted to Blacks who were Laborers, Croppers, or Tenants at time t-1.

on a rung. Some are clearly on the fast track while others never move from the wage worker

category. About 25 percent of possible moves occur during the Depression years of 1930-1937.

The boom years of the War and immediate post-war period (1917-1920) account for 16 percent

of possible moves.

In Table 7 we present the regression results from an ordered probit estimation, with the

Table 7
Coefficients and Marginal Effects from Ordered Probit Regression
(Standard Errors Corrected for Clustering)

			Status at Time t		
	Coeff	**Laborer**	**Cropper**	**Tenant**	**Owner**
Variable & Status at t-1	δ	$\partial \Pr(L_t)/\partial X_j$	$\partial \Pr(C_t)/\partial X_j$	$\partial \Pr(T_t)/\partial X_j$	$\partial \Pr(O_t)/\partial X_j$
Laborer					
Age	-0.0862***	0.0317***	-0.0311***	-0.0007**	
War (1917-20)	-0.7226**	0.2135***	-0.2113***	-0.0022	
Interwar (1921-29)	-0.4600**	0.1495**	-0.1476**	-0.0019	
Depression (1930-37)	-0.1091	0.0392	-0.0385	-0.0007	
Years in Status	0.0370	-0.0136	0.0133	0.0003	
Predicted Probability		0.6561	0.3415	0.0024	
Cropper					
Age	0.0012	-0.0002	-0.0001	0.0003	
War (1917-20)	-0.0669	0.0111	0.0037	-0.0148	
Interwar (1921-29)	-0.0217	0.0035	0.0014	-0.0049	
Depression (1930-37)	-0.0918*	0.0155*	0.0045	-0.0200*	
Years in Status	-0.0051**	0.0008*	0.0004**	-0.0012**	
Predicted Probability		0.0872	0.7669	0.1459	
Tenant					
Age	0.0704***	0.0000	-0.0091***	0.0016	0.0075***
War (1917-20)	-0.0457	0.0000	0.0061	-0.0014	-0.0047
Interwar (1921-29)	-0.4124**	0.0002	0.0713**	-0.0402*	-0.0312**
Depression (1930-37)	-0.7725***	0.0008	0.1657***	-0.1227***	-0.0438***
Years in Status	-0.0126*	0.0000	0.0016**	-0.0003	-0.0013*
Predicted Probability		0.0000	0.0666	0.8814	0.0520

Log Likelihood	-2043.5691
Pseudo R-Squared	0.4847
Observations	3627.0000

Significant at * 10%; ** 5%; *** 1%

Note: The sample is restricted to Blacks who were Laborers, Croppers, or Tenants at time t-1. δs are the ordered probit regression coefficients. $\partial \Pr(L_t)/\partial X_j$ is the change in the probability (evaluated at the sample means) of becoming a Laborer at time t associated with a one unit change in the variable X_j. The marginal effects for becoming a Cropper (C) , Tenant (T), or Owner (O) are defined analogously. The regression uses the Huber-White sandwich estimator to adjust the variance-covariance matrix to correct for correlated responses from cluster samples (Huber, P.J., *Proc Fifth Berkeley Symposium Math Stat* 1:221-33, 1967; White, H.,. *Econometrica* 50:1-25, 1982).

standard errors corrected for clustering.[31] In order to account for the high degree of stasis shown

in Table 5, we estimate $P_{ij}(t)$, which is the probability that an individual i was in tenure category j

(=laborer, cropper, tenant, owner) at time t, as a function of his characteristics at time t, $X_i(t)$, and

his tenure status at time t-1, $P_{ij}(t$-$1)$. This is a first-order Markov chain:

$$P_{ij}(t) = f(P_{ij}(t\text{-}1), \beta'X_i(t), \textrm{:}_i(t))$$

where β' is a vector of coefficients to estimate and $\textrm{:}_i(t)$ is a random error term. The individual's

previous tenure status is introduced by including interactions between dummies for having been

a laborer, cropper, or tenant at time t-1 into the ordered probit regression. To take advantage of

the panel structure of the data (with repeated observations on the same individuals over a number

of years), we correct the standard errors for clustering, allowing $\textrm{:}_i(t)$ to be correlated over t

within the career of any individual i.

The marginal effects are calculated at the mean age and years in tenure status for the time

t-1 tenure class, and the omitted category for the time dummies (pre-1916). The estimates

demonstrate that agriculture provided some upward mobility for blacks in the cotton belt, though

for laborers and croppers, this mobility was not positively associated with age. In fact, a standard

deviation increase in age for black wage workers (10 years) decreased the likelihood of moving

to the cropper rung by 31 percentage points and increased the probability of remaining in the

laborer category by the same magnitude. To the extent that movement upward from laborer

occurs, it must result from unobserved individual heterogeneity (luck or hard work) or from the

impact of particular time periods. As it does for wage workers, individual variation in initiative

or good luck influences the movement of croppers. Age does not influence moving from

sharecropper to tenant or from cropper to laborer. Age does, however, result in a greater

---

[31] We also estimated the coefficients with an ordered probit regression controlling for random effects. The two
estimations yielded the same substantive results so we only report the estimates with the standard errors corrected
for clustering.

likelihood that tenants will become owners (and a reduced likelihood that tenants will fall to cropper). This is consistent with the view that over time tenants accumulated physical capital to weather a few bad years. A standard deviation increase in age for tenants (12 years) reduces the likelihood of falling down the ladder to cropper by 11 percentage points, while raising the likelihood of attaining ownership by 9 percentage points. Years in their current status had an impact on subsequent status for both croppers and tenants: more time spent as a cropper reduced the odds of moving up to tenant, while increasing the odds of remaining a cropper or falling to laborer, and more time as a tenant increased the odds of falling to cropper and reduced the odds of moving up to owner. A standard deviation increase in time as a cropper (9 years) made moving up to tenant 1 percentage point less likely and made remaining a cropper 0.4 percentage points more likely and falling to laborer 0.7 percentage points more likely.

The Depression hit tenants the hardest. In each year of the Depression, tenants had a seventeen percentage point increased likelihood of falling down the ladder to cropper. The Depression also reduced the upward mobility and increased the downward mobility of croppers, though the effect was smaller than that for tenants: croppers saw the probability of ascent and descent fall and rise by 2% points. The war years generally reduced upward mobility for laborers and had no substantial impact on mobility for croppers or tenants. For tenants, the likelihood of falling down the ladder was small, which is what we expected given the high wartime prices of cotton. The interwar years had an impact for both laborers and tenants: laborers were less likely to move up to cropper and tenants were less likely to become owners and more like to end up as croppers than in the years before World War I.[32]

Table 8 adds two variables that measure the individual's capital: years of schooling

---

[32] We find this result somewhat surprising given the high level of foreclosures. We thought that this would increase the likelihood of tenants acquiring a farm.

Table 8

Coefficients and Marginal Effects from Ordered Probit Regression
(Standard Errors Corrected for Clustering)

Variable & Status at Time *t-1*	*Coeff* δ	**Status at Time *t*** *Laborer* $\partial \Pr(L_t)/\partial X_j$	*Cropper* $\partial \Pr(C_t)/\partial X_j$	*Tenant* $\partial \Pr(T_t)/\partial X_j$	*Owner* $\partial \Pr(O_t)/\partial X_j$
Laborer					
Age	-0.0610 ***	0.0211 ***	-0.0209 ***	-0.0003 *	
War (1917-20)	-0.5028 *	0.1471 *	-0.1460 *	-0.0011	
Interwar (1921-29)	0.3064	-0.1134	0.1113	0.0021	
Depression (1930-37)	0.6236 **	-0.2392 **	0.2321 **	0.0071	
Years in Status	0.0229	-0.0079	0.0078	0.0001	
Schooling	-0.1462 ***	0.0506 ***	-0.0500 ***	-0.0006	
Inheritance	0.0046 ***	-0.0016 ***	0.0016 ***	0.0000	
Predicted Probability		0.7023	0.2964	0.0013	
Cropper					
Age	0.0001	0.0000	0.0000	0.0000 ***	
War (1917-20)	-0.0489	0.0074	0.0034	-0.0108	
Interwar (1921-29)	0.0010	-0.0001	-0.0001	0.0002	
Depression (1930-37)	-0.0702	0.0107	0.0045	-0.0153	
Years in Status	-0.0038	0.0006	0.0003	-0.0009	
Schooling	0.0164	-0.0024	-0.0013 *	0.0037	
Inheritance	0.0000	0.0000	0.0000	0.0000	
Predicted Probability		0.0779	0.7788	0.1432	
Tenant					
Age	0.0612 ***	0.0000	-0.0074 ***	0.0007	0.0067 ***
War (1917-20)	-0.1353	0.0000	0.0182	-0.0048	-0.0134
Interwar (1921-29)	-0.3096 **	0.0001	0.0473 *	-0.0208	-0.0265 **
Depression (1930-37)	-0.6394 ***	0.0003	0.1214 ***	-0.0799 **	-0.0419 ***
Years in Status	-0.0101	0.0000	0.0012	-0.0001	-0.0011
Schooling	0.0904 ***	0.0000	-0.0110 ***	0.0010	0.0100 ***
Predicted Probability		0.0000	0.0614	0.8842	0.0543

Observations	3,627
Log Likelihood	-1966.6
Pseudo R-Squared	0.5042

Significant at * 10%; ** 5%; *** 1%

Note: The sample is restricted to Blacks who were Laborers, Croppers, or Tenants at time t-1. δs are the ordered probit regression coefficients. $\partial \Pr(L_t)/\partial X_j$ is the change in the probability (evaluated at the sample means) of becoming a Laborer at time t associated with a one unit change in the variable X_j. The marginal effects for becoming a Cropper (C) , Tenant (T), or Owner (O) are defined analogously. The regression uses the Huber-White sandwich estimator to adjust the variance-covariance matrix to correct for correlated responses from cluster samples (Huber, P.J., *Proc Fifth Berkeley Symposium Math Stat* 1:221-33, 1967; White, H.,. *Econometrica* 50:1-25, 1982).

(human capital) and the dollar value of any inheritances received in year t-1 (financial capital). Schooling was generally beneficial, promoting some upward mobility for croppers and tenants and preventing some downward movement.[33] Its impact for laborers, however, was to reduce mobility. A standard deviation increase in schooling for laborers (2.5 years) was associated with a greater probability of remaining a laborer (13 percentage points), and an equal decrease in the probability of rising to sharecropper. For croppers, a standard deviation increase in schooling had a small (0.3 percentage point) negative effect on remaining a cropper. Tenants were 2.5 percentage points more likely to become owners if they had an additional standard deviation of schooling, and correspondingly less likely to fall to cropper.

No one who was a tenant received an inheritance in year t-1, so the importance of inheritances could be assessed only for those who were laborers or croppers at time t-1. The receipt of an inheritance in year t-1 made upward movement from laborer to tenant more likely: an increase in the inheritance of one standard deviation ($70) made a laborer 8 percentage points more likely to rise to cropper, and 7 percentage points less likely to remain a laborer.

When the coefficients are examined jointly, it becomes clear how individuals could become trapped at particular rungs on the ladder. For example, for an individual who began his career as a wage worker, each additional year of age increased the probability that the individual would remain a wage worker by 2 percentage points. Each additional year as a wage worker raised the probability of escaping this category by only 0.8 percentage points, so absent any other change, the passage of time would continuously reduce the individual's odds of moving up. The receipt of an inheritance, however, would be to bump the wage worker up onto a more favorable trajectory.

---

[33] This is consistent with Schuler's overall observation that schooling was particularly beneficial for blacks in the South.

VI.   Conclusion

Despite the legal and social discrimination faced by blacks in the plantation South in the early part of the twentieth century, there was some economic mobility. The mobility experienced over the course of a decade was similar in magnitude and character to that observed for blacks in the general population in the 1920s and even in the 1970s. Both the interwar years and the Depression increased the likelihood of tenants falling to cropper and reduced their ability to attain ownership status. The Depression years increased the likelihood of laborers rising to the sharecropper level. We also find some evidence of an upward sloping age tenure profile, though the magnitude of the effect of age is not as great as the magnitude of unobserved individual effects. For many, a career in agriculture was akin to climbing with the aid of an escalator while for others it was like Sisyphus pushing his rock up the mountain.[34] The difference between ascension and entrapment was individual initiative or good luck.

---

[34] For a moving oral history of a black man in the South who rose rapidly up the agricultural ladder, see Rosengarten (1974).

REFERENCES

Alesina, Alberto, and Elian La Ferrera (2001). "Preferences for Redistribution in the Land of
  Opportunities," NBER Working Paper No. W8267 (May).
Allen, Douglas W., and Dean Lueck (1992). "Contract Choice in Modern Agriculture: Cash Rent
  vs. Cropshare." *Journal of Law and Economics* 35 No. 2 (October): 397-426.
Allen, Douglas W., and Dean Lueck (1993). "Transaction Costs and the Design of Cropshare
  Contracts." *RAND Journal of Economics* 24 No.1 (Spring): 78-100.
Allen, Douglas W., and Dean Lueck (1999). "The Role of Risk in Contract Choice." *Journal of
  Law, Economics and Organization* 15 No.3 (October): 704-736.
Alston, Lee J. (1981). "Tenure Choice in Southern Agriculture 1930-1960." *Explorations in
  Economic History* 18: 211-232.
Alston, Lee J., Datta, Samar, and Nugent Jeffrey B. (1984). "Tenancy Choice in a Competitive
  Framework with Transactions Costs." *Journal of Political Economy*, 92: 1121-1133.
Alston, Lee J. and Ferrie, Joseph. (1993). "Paternalism in Agricultural Contracts in the U.S.
  South: Implications for the Growth of the Welfare State." *American Economic Review*
  83: 852-876.
Alston, Lee J. and Ferrie, Joseph (1999). *Paternalism and the American Welfare State:
  Economics, Politics, and Institutions in the U.S. South, 1865-1965*. Cambridge:
  Cambridge University Press.
Alston Lee J. and Andres Gallo (2003). "The Erosion of Rule of Law in Argentina, 1930-1947:
  An Explanation of Argentina's Slide from the Top Ten." Working Paper May 2003.
Alston, Lee J. and Hatton, T.J. (1991). "The Earnings Gap Between Agricultural and
  Manufacturing Laborers, 1925-1941." *Journal of Economic History* 5: 83-99.
Alston, Lee J. and Higgs, Robert (1982). "Contractual Mix in Southern Agriculture since the
  Civil War: Facts, Hypotheses and Tests." *Journal of Economic History* 42: 327-353.
Alston, Lee J. and Kauffman, Kyle D. (1997). "Agricultural Chutes and Ladders: New Estimates
  of Sharecroppers and 'True Tenants' in the South, 1900-1920." *Journal of Economic
  History* 57: 464-575.
Alston, Lee J. and Kauffman, Kyle D. (1998). "Up, Down, and Off the Agricultural Ladder: New
  Evidence and Implications of Agricultural Mobility for Blacks in the Postbellum South."
  Agricultural History 72: 263-279.
Atack, Jeremy. (1988). "Tenants and Yeoman in the Nineteenth Century." *Agricultural History*
  62: 6-23.
Atack, Jeremy. (1989). "The Agricultural Ladder Revisited: A New Look at an Old Question
  with Some Data for 1860." *Agricultural History* 63: 1-25.
Black, John D. and Allen, R.H. (1937). "The Growth of Farm Tenancy in the United States." *The
  Quarterly Journal of Economics* 51: 393-425.
Blalock, H.W. (1937). "Plantation Operations of Landlords and Tenants in Arkansas." University
  of Arkansas, College of Agriculture, Agricultural Experiment Station, *Bulletin No. 339*
  (May).
Botticini, Maristella and Kyle D. Kauffman (2000). "Do Women Matter? Household Structure,
  Risk, and Contract Choice." Paper presented at the year 2000 annual meeting of the
  International Society for New Institutional Economics.
Brandt, Karl (1938), "Fallacious Census Terminology and its Consequences in Agriculture."

Social Research: An International Quarterly of Political and Social Science **5**: 19-36.

Eswaran, Mukesh and Kotwal, Ashok (1985). "A Theory of Contractual Structure in Agriculture." *American Economic Review*, (June 1985): 352-367.

Ferleger, Louis (1993). "Sharecropping Contracts in the Late-Nineteenth-Century South." *Agricultural History* 67: 31-46.

Ferrie, Joseph P. (2003). "Economic Mobility in the U.S: Longitudinal Evidence on Occupational Change, Geographic Movement, and Wealth Accumulation, 1850-2000." Unpublished, Northwestern University.

Gibbons, Robert (1997). "Incentives and careers in organizations," in *Advances in economics and econometrics: theory and applications. Seventh World Congress, Volume II.* Edited by David M. Kreps and Kenneth F. Wallis. Cambridge: Cambridge University Press.

Goldenweiser E.A. and Truesdell, Leon E. (1924) "Farm Tenancy in the United States." *Census Monograph IV,* Washington D.C.: Government Printing Office.

Gray, L. C., Stewart, Charles L., Turner, Howard A., Sanders, J.T., and Spillman, W.J. (1924) "Farm Ownership and Tenancy." U.S. Department of Agriculture, *Yearbook, 1923*. Washington D.C.:Government Printing Office,: 507-600.

Hibbard, Benjamin H. (1913), "Tenancy in the Southern States," *Quarterly Journal of Economics* 27: 482-496.

Higgs, Robert. (1973). "Race, Tenure and Resource Allocation in Southern Agriculture, 1910." *Journal of Economic History*, 33: 149-169.

Higgs, Robert (1974), "Patterns of Farm Rental in the Georgia Cotton Belt." *Journal of Economic History* 34: 468-482.

Higgs, Robert (1977), *Competition and Coercion:Blacks in the American Economy, 1865-1914*. New York: Cambridge University Press.

Huber, P.J. (1967). "The Behavior of Maximum Likelihood Estimates Under Nonstandard Conditions." *Proceedings Fifth Berkeley Symposium Mathematical Statistics* 1 (1967): 221-33.

Kauffman, Kyle D. (1993). "Why Was the Mule Used in Southern Agriculture?: Empirical Evidence of Principal -Agent Solutions." *Explorations in Economic History* 30 (1993): 336-351.

Johnson, H. Thomas (1973-74), "Postwar Optimism and the Rural Financial Crisis of the 1920s," *Explorations in Economic History* II No 2 (Winter).

Putterman, Louis, John Roemer and J. Sylvestre (1996). "Does Egalitarianism Have a Future?" *Journal of Economic Literature,* XXXVI: 861-902.

Reid, Joseph D., Jr. (1973). "Sharecropping as an Understandable Market Response: The Post-Bellum South." *Journal of Economic History* 33: 106-130.

Reid, Joseph D., Jr. (1975). "Sharecropping in History and Theory." *Agricultural History* 49: 426-440.

Rosenegarten, Theodore (1974). *All God's Dangers: The Life of Nate Shaw*. New York: Knopf.

Schuler, E.A. (1938). "Social Status and Farm Tenure-Attitudes and Social Conditions of Corn Belt and Cotton Belt Farmers," United States Department of Agriculture, The Farm Security Administration, and the Bureau of Agricultural Economics Cooperation. *Social Research Report No. IV*. Washington D.C.

Shlomowitz, Ralph (1979). "The Origins of Southern Sharecropping." *Agricultural History* 53 (1979): 557-575.

Whatley, Warren (1983). "Labor for the Picking: The New Deal in the South." *Journal of*

Economic History 43: 905-30.

White, H. (1982). "Maximum Likelihood Estimation of Misspecified Models." *Econometrica* 50: 1-25.

Woodman, Harold D. (1979). "Post-Civil War Southern Agriculture and the Law." *Agricultural History* 53: 319-337.

Woodman, Harold D. (1995) *New South: New Law*. Baton Rouge: Louisiana State University Press.

Woofter, Thomas J. (1936). *Landlord and Tenant on the Cotton Plantation.* Washington, DC: Works Progress Administration.

Wright, Gavin. (1986). *Old South, New South: Revolutions in the Southern Economy Since the Civil War.* New York: Basic Books.

Wright, Gavin. (1987). "Postbellum Southern Labor Markets." in *Quantity and Quiddity*. Edited by Peter Kilby. Middleton, CT: Wesleyan University Press.

U.S. Bureau of the Census. (1916). *Plantation Farming in the United States*. Washington, GPO.

U.S. Bureau of the Census. (1920).*U.S. Census of Agriculture*. Washington, GPO.