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One Kind of Freedom: Reconsidered (and Turbo Charged)[1]

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Since *One Kind of Freedom* was published in 1977 there have been enormous advances in computer technology and statistical software, and an impressive expansion of microlevel historical data sets. In this essay we "reconsider" our earlier findings on the consequences of emancipation in terms of what might be accomplished using the new technology, methods, and data. We employ the entire sample of 11,202 farms collected for the Southern Economic History Project, not the subsample used to prepare *One Kind of Freedom*. We revisit the question of declining production of foodstuffs, examining the data this time on a farm-by-farm basis. We conclude that 30% of farms in the cotton regions were "locked-in" to cotton production and another 16% were producing too much food in an effort to avoid the trap of debt peonage. Using probit methods to control for the effects of age, farm size, literacy, family workers, and willingness to assume risk, we find that race accounts for two-thirds of the gap between black and white ownership of farms. Comparing sharecropping and renting, we find that race was much less of a factor in tenure choice. We note that these efforts only scratch the surface of what remains to be done.

It has been more than three decades since the National Science Foundation provided the funding to establish the Southern Economic History Project. We could hardly have guessed in 1968 that our project, which culminated in the publication of *One Kind of Freedom* in 1977, would have such a long-lasting impact on the way scholars viewed the postbellum American South.[2] We have

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[2] The book is subtitled *The Economic Consequences of Emancipation* (Cambridge Univ. Press, first edition 1977, reprinted 1978, 1983, 1986, 1988, second edition 2000). Hereafter we refer to it as 1KF.

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been away from the subject for many years, so it was with a mixture of trepidation and excitement that we set out on our return. The fear was a product of a concern that our quarter-of-a-century-old ideas and logic might not withstand the scrutiny of new evidence, new methods, new questions, and new sensibilities. Excitement, fortunately, quickly took over from fear as we realized how much of what we had hoped to accomplish with the Southern Economic History Project, but were unable to do so at the time, was now possible. Faster computers, new methods of quantitative analysis, and newly available large-scale samples from the population censuses of 1870 and 1880 empower us today to a degree we did not imagine possible a quarter of a century ago.

In this article we display a small sampling of what can be done today with the data we collected in the late 1960s. Our purpose is twofold. First, we had intended from the beginning to explore some of the issues we raised in 1KF in greater depth and with wider range. Other topics and different issues, however, always seemed to distract us from that plan. We are, therefore, grateful for both the excuse and the opportunity provided by the National Science Foundation's retrospective conference at Lehigh University to take another look at the economic consequences of emancipation. We found our new results sufficiently tantalizing and fascinating that we wish to share them. Second, we hope to persuade some readers that there is much work left to be done on the post-bellum economy of the American South. Economic historians are needed to help tell the story of how newly emancipated black Americans shaped a life for themselves under freedom—that is, under the kind of freedom that was permitted by their time, the cotton economy, and the dominant white culture.

Our plan is to add to 1KF new data and new econometric methodology, to demonstrate the power of these new tools to elicit a better understanding of that time and place, and to advertize the availability of data we collected long ago, but never used. We hope thereby to inspire a new generation of scholars to take a fresh look at a key moment in the social and economic history of the United States. It was a moment that, arguably, constrained the agenda for race relations, southern economic progress, and black economic fulfillment right to the present day. We thought in 1968 and we still think today that there is no more important set of issues for American economic historians to understand.

WHOLE SOUTH, COTTON SOUTH

When we designed the Southern Economic History Project we heaped all 11 Confederate States, the whole South, onto our plate.[3] In the event, the meal

[3] The states that attempted to secede from the United States were Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, Mississippi, Arkansas, Louisiana, and Texas. Virgina excludes West Virginia, the breakaway region of that state which latter entered the Union in its own right. Not included in our study were the four "border states"—Delaware, Maryland, Kentucky and Missouri—although they shared a strong common tie to these states, the institution of chattel slavery.

proved too large for us to digest. We began from the premise that post-emancipation black economic history must be rooted in an *agricultural* history of the South, so we began by examining the quantitative evidence on southern agriculture. At the time, the earliest published data that identified tenure and farm characteristics by race was the 1900 Census—which was taken 35 years after emancipation. We knew that data on race and tenure for earlier census years had been collected, though it had never been published. Our challenge was to locate the *manuscript* schedules of the 1880 Census of Agriculture (which would contain the agricultural data) and pair the demographic characteristics of farm operators identified in population schedules. Eventually, we were able to construct a sample of 11,202 individual farming units drawn from the 1,230,905 southern farms surveyed by the census takers in 1880.

At the outset, we divided the whole South into 61 homogeneous economic regions and drew one or more representative counties from each region. Our goal was a region-by-region analysis of the whole South. We sought to learn from such an exercise the economic influences of soil type, of crop choice, and of geographical isolation. We planned numerous reports on emancipation and Reconstruction in the sugar parishes, in tobacco country, and on the Sea Islands and along the Carolina and Georgia coast. We were surpised to find that, at least with regard to the situation of blacks in the postwar South, our sample of farms produced results that showed "a remarkable uniformity across the Confederate States" (1KF, p. 275). This made our task much easier; we could present our results without the distractions of reciting details of regional differences, geographical primacy, or local particularities. But there was a danger here: historians like texture and complexity.[4] In the early 1970s the scholarly world was not yet entirely safe for the "New Economic History." Would our readers be too suspicious of the elegance and economic determinism implied by uniformity?

We gambled that if we buried our findings of uniformity in Appendix G, "Descriptions of Major Collections of Data Gathered by the Southern Economic History Project," and narrowed our own focus from 61 regions and 993 counties in the entire South to 17 regions and 336 counties in what we defined as the Cotton South (see map, Fig. 1), we could avoid the charge of overgeneralization. Historians and economists could accept the economic and social uniformity of the Cotton South based on the unifying salience of the staple crop. For *One Kind of Freedom* and for our subsequent papers on the post-emancipation South we used data from 27 of the selected counties and only 4,695 farming units.[5] Until

[4] By and large, historians' treatment of the period has been presented in a series of state and local studies which implicitly and explicitly hold that the post-emancipation South was somehow different in Mississippi from in North Carolina, different in cotton fields from in sugar fields, different in the delta from in the upland regions.

[5] The full sample included 5,318 farms that were in the Cotton South; however, because of various problems with data, 623 farms were excluded from the analysis (1KF, pp. 291–293).

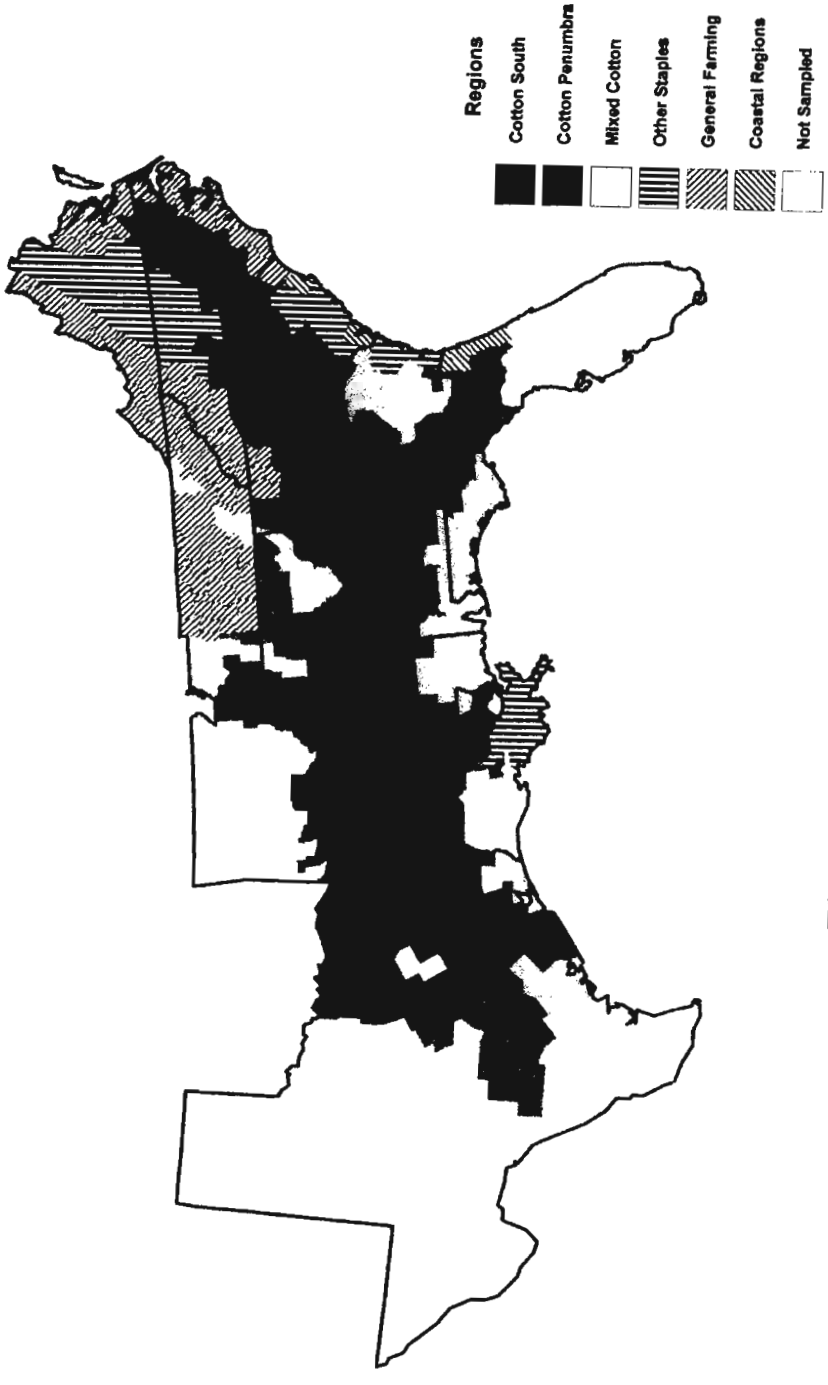

FIG. 1. Staple regions of the Cotton South in 1880.

this year, we had not returned to the full sample, and we had written nothing about what we might call the Peripheral South.

A cynical reviewer of 1KF might wonder what was hidden in this periphery. After all, it is rather suspicious when a researcher throws away more than half the data he or she has collected at a significant expense of time and taxpayers money. Unfortunately, few have been curious enough to explore the data on their own. Perhaps there are too few cynics in the profession. We shared our data with others, and the full data set has been resting peacefully in an ICPSR crypt for the past decade (Sutch and Ransom, 1990). One reason for this lack of attention is the difficulty in using the ICPSR computer file. It still exhibits the awkwardness of having been born in an age of 80-column punch cards. It is organized in a way that is, and embeds formats that are, ill-suited to modern statistical packages. We can now, with fast computers, STATA, and 25 years of distance, finally take a look at the Peripheral South.

First, we cleaned the entire sample of farms. The data were converted to software-compatible code and were placed on a convenient medium.[6] Next we sought to replicate the tables in 1KF that used the sample of farming units from the Cotton South and then repeated the same exercise for the farms of the Peripheral South. The results of this exercise generally support the claim we made in 1KF:

> The only pronounced divergence from the general pattern was exhibited by regions characterized by diversified farming and the absence of a staple crop. These regions—concentrated for the most part in western Virginia, western North Carolina, and eastern Tennessee—were coincidentally the areas of the antebellum South that made the least use of slave labor and that were thought of, both before and after the war, as the most backward. In regions whose agricultural economy was based upon a cash crop, our findings were remarkably uniform. (1KF, p. 275)

Third, we have explored in greater detail two issues, the occupations and labor force participation of blacks and whites and the postwar decline in food production, using the whole South sample.

Unfortunately, none of the original region-by-region statistical results remain for the Southern Economic History Project, nor do we have a computer file with the 4,695 farms we actually used in the computations reported in 1KF.[7] So we must be guided by the data and not our project archives. For this report we have divided the whole South into the Cotton South, as we defined it in 1KF, and the

[6] The full data sample is available on compact disk in six different formats, including STATA, SPSS, SAS, and ASCII. Copies of this disk may be obtained from Cambridge University Press. An archive copy has been deposited with the Interuniversity Consortium for Political and Social Research.

[7] The problems we encountered in trying to exactly recreate the original Ransom–Sutch sample of 4,695 farms described in Appendix G of 1KF are discussed in the README file on the compact disk containing the complete sample of farms. The results reported in this article for the Cotton South are based on 4,584 farms in 27 counties.

Peripheral South. The Peripheral South was further subdivided into five regions shown on the map (see Fig. 1). The regions are: the Cotton Penumbra adjacent to and surrounding the Cotton South, where cotton was the primary cash crop for most farms; the Mixed Cotton Region, where cotton was grown on many farms but as a secondary crop in a context of general farming; the Rice or Sugar and Cotton Region along the Atlantic (rice) and Gulf (sugar) Coasts, where those were the predominant cash crops but where cotton was also important; the Tobacco Region of Virginia and North Carolina; and the General Farming Region in Tennessee and Western Virginia.[8] The rice, sugar, and tobacco regions are identified on the map as "Other Staples."

BLACK OCCUPATIONS AND LABOR FORCE PARTICIPATION

The map illustrates how ubiquitous the cultivation of cotton was in the former Confederate States in 1880 even outside of the core Cotton South defined for 1KF. Three out of every four farms in our sample reported some acreage planted in cotton. Figure 2 reports the fraction of farms growing cotton in each region.[9] In every region of the South, except for the mixed farming and tobacco areas of Tennessee and Virginia, cotton was an omnipresent feature of the agricultural landscape.

For black farmers the dependence on cotton was even higher than these aggregate figures. Over 80% of the farms operated by blacks reported devoting some acreage to growing cotton. In part, this simply reflects the fact that 54% of the black population in the South lived in the Cotton South, while less than 10% of the black population lived in the General Farming Region. But it also reflects the variety of constraints on black farmers' choice of crop mix and tenure. Black farmers worked with less land, which was less fertile, and with less human and agricultural capital and restricted access to farm credit. Summing up the position of blacks in the South in 1880, we wrote in 1KF that

> emancipation removed the legal distinction between the South's two races, but it left them in grossly unequal positions. The blacks lacked assets; they lacked education; they lacked skills. . . . When necessary, a campaign of violence was launched to prevent blacks from acquiring assets, education or skills. But violence was only the most visible way in which racial suppression worked. The most powerful and damaging way was indirect. Southerners erected an economic system that failed to reward individual initiative on the part of blacks and was therefore ill-suited to their economic advancement (1KF, p. 186)

[8] The sixth region identified on the map includes counties along the coast of South Carolina, and Georgia, where the U.S. government gave a substantial amount of land to freed slaves during the Civil War (1KF, p. 82; Rose, 1964). Many of the freed slaves who received this land were still farming these holdings in 1880. Consequently, these counties have an uncharacteristically high fraction of black farm operators, and they were farming very small plots of land. For this reason, we have not included them in the discussion of this article.

[9] The statistical results were calculated from weighted data. The weights adjust for the different sampling rates in the various subregions of the South. See 1KF, pp. 291–295, and Ransom and Sutch (1971). The tobacco region is not included in Fig. 2.

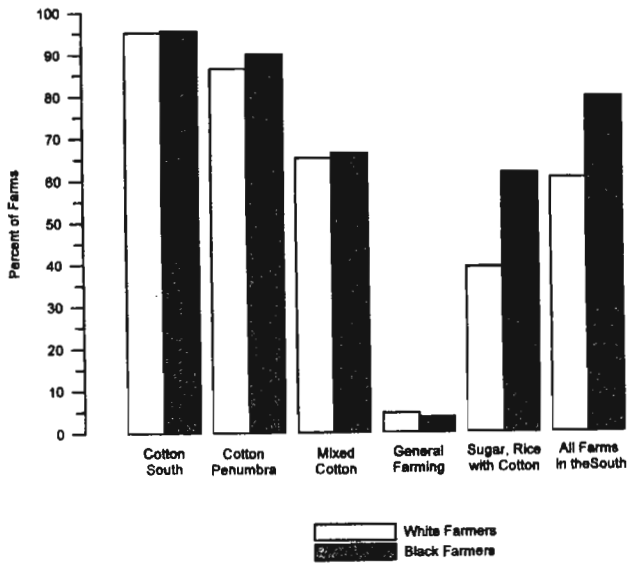

FIG. 2. Percentage of small-scale family farms reporting cotton acreage by race and region in the South, 1879.

These conclusions were based on our analysis of blacks' economic situation in the Cotton South (Ransom and Sutch, 1972; Ransom and Sutch, 1973). Twenty-eight years later, we have no inclination to change that assessment. However, with the enhanced computer capabilities of the 1990s we can now examine the complete sample of 11,202 farms to compare the situation of farmers *outside* the Cotton South with those living in the heart of the cotton culture that was the focus of 1KF. One of our main concerns is to assess the progress of black welfare after emancipation throughout the rural South. To make comparisons across region, race, and tenure more meaningful, we will concentrate our analysis on what we termed *small family farms* in 1KF. These were farms that relied primarily on family members for the farm labor and had fewer than 50 acres planted in crops.[10] The cultivation of tobacco, rice, or sugar introduces issues specific to those crops that require more space to deal with than we have in this report. The basic comparisons we make here are between farming in the Cotton South and Cotton Penumbra, on the one hand, and the Mixed Cotton Region and the Region of General Farming on the other.

The population of slaves before the Civil War was concentrated in the two cotton regions, and the freed slaves remained in those regions after 1865 as farmers and farm laborers. The most visible change in the southern agricultural landscape over this period was the appearance of thousands of small-scale,

[10] See 1KF, p. 294, for the discussion of the classification of farms.

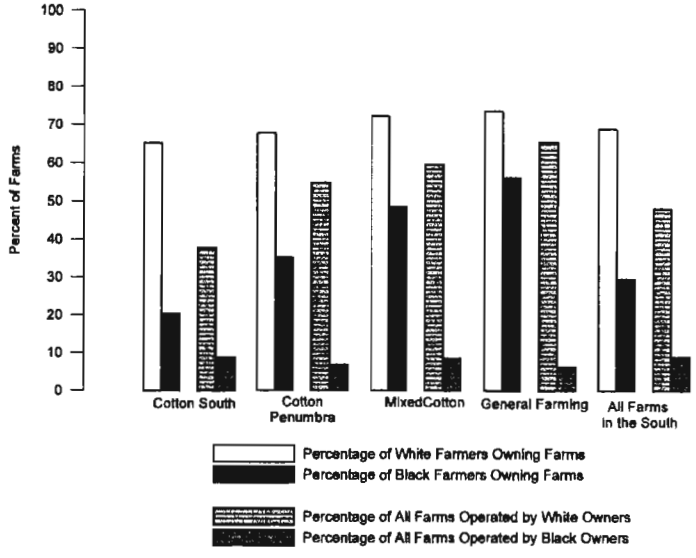

FIG. 3. Farm ownership by race and region in the South, 1880.

family-operated farms, most of them rented for cash or a share of the crop. These enterprises largely replaced the antebellum plantation.

One of the strongest desires of blacks trying to escape the lingering effects and memory of slavery was a desire to gain independence for themselves and their family. To this end, blacks fiercely resisted the "gang" system of labor that prevailed on most antebellum plantations. Indeed, this resistance was instrumental in bringing about the demise of the plantation immediately following the war. To blacks, the obvious way to ensure a greater degree of independence was to own their own farms. However, as we noted in 1KF, this effort was stymied by the general reluctance whites to sell land to blacks or even to tolerate black land ownership. Figure 3 presents data on farm ownership by race throughout the South. In the Cotton South, one in five black farm-operators owned their own farm in 1880; in the Cotton Penumbra it was just over 35%. In the General Farming Area the fraction rose to 56%. While these figures suggest some success on the part of blacks outside the cotton regions in gaining ownership of their own farm, we must remember that most blacks did not live in the mixed farming regions. Thus, we see in Fig. 3 that the percentage of all farms that are owned by blacks in each region stays remarkably constant at about 6 to 8% throughout the South.

Denied land ownership, blacks sought to rent land for farming as the next-best solution. While they made impressive gains considering the resistance by whites to any form of tenure that allowed blacks to have their own farm, blacks were frequently relegated to renting for shares—the least desirable form of tenure. Twice as many black tenants were sharecroppers than were cash tenants in the

TABLE 1
Percentage of the Population 15 and Over in the Labor Force: Race, Sex, and Region in the South, 1880

	Percentage of males aged 15+ working as:			Labor force participation rate	Percentage of females aged 15+ working as:			Labor force participation rate
	Farm operator	Farm laborer	Nonfarm occupation		Farm operator	Farm laborer	Nonfarm occupation	
All races:								
Cotton South	41.7	29.0	23.1	93.8	2.1	16.3	30.3	48.8
Cotton Penumbra	41.9	23.0	28.0	92.9	1.8	8.5	21.2	31.5
Mixed Cotton	36.3	19.6	34.4	90.3	1.5	4.5	16.2	22.2
Sugar/Rice & Cotton	17.4	16.4	58.4	92.2	2.8	10.2	32.6	45.6
Tobacco	35.1	27.1	31.7	93.9	0.9	3.6	16.5	21.0
Sea Islands	19.2	19.2	55.1	93.5	0.9	10.4	34.4	45.8
Mixed Farming	39.5	22.4	30.2	92.0	0.8	1.8	12.0	14.6
Total	39.2	25.6	28.3	93.1	1.7	10.3	23.6	35.6
Whites:								
Cotton South	49.9	20.5	21.7	92.0	1.7	2.3	7.5	11.6
Cotton Penumbra	47.6	19.7	24.9	92.3	1.7	2.7	8.6	12.9
Mixed Cotton	43.1	16.6	30.0	89.7	1.5	2.2	8.0	11.7
Sugar/Rice & Cotton	21.6	10.9	58.2	90.7	2.0	1.0	10.2	13.2
Tobacco	45.2	20.1	27.2	92.5	1.3	1.3	8.5	11.0
Sea Islands	27.0	9.5	52.7	89.2	—	—	9.7	9.7
Mixed Farming	45.2	20.7	25.6	91.5	0.7	1.0	6.9	8.6
Total	46.6	19.8	25.3	91.8	1.6	2.1	8.6	12.3
Blacks:								
Cotton South	33.5	37.6	24.6	95.7	2.0	28.9	49.8	80.7
Cotton Penumbra	29.0	30.8	34.4	94.3	2.1	20.5	46.6	69.2
Mixed Cotton	22.0	26.0	43.7	91.7	1.0	6.8	23.4	31.3
Sugar/Rice & Cotton	15.1	19.4	58.6	93.1	3.2	14.9	44.1	62.3
Tobacco	19.9	37.5	38.5	96.0	0.2	7.0	28.6	35.9
Sea Islands	15.0	24.3	56.4	95.7	1.3	14.7	44.7	60.7
Mixed Farming	19.2	28.2	46.4	93.8	1.0	4.5	29.9	35.5
Total	28.4	34.0	32.5	95.0	1.8	21.6	44.3	67.7

Cotton South, and the ratio was even higher elsewhere. The picture of black "success" implied by the tenure data ignores a large segment of the population that did not live on farms and worked outside the agricultural sector. These people would fall outside the scope of our sample, which included demographic data only for the farm family and persons living on the farm.[11] Today, however, we can construct a more complete picture of farm occupations using data from the Integrated Public Use Microdata Series (IPUMS) data set for the 1880 Census of Population.[12] Table 1 presents data on labor force participation by three occupation groups in each region of the South in 1880.

Those who could not become farm operators—and in the case of blacks this

[11] We were not unaware of this omission in when we wrote 1KF. In our first attempt to characterize the agricultural conditions for blacks after the Civil War we constructed an estimate of the agricultural labor force in 1870 and 1880 (Ransom and Sutch, 1969).

[12] On the IPUMS, see Sobek and Ruggles (1999). In addition to the sample for the population of 1880 the IPUMS contains samples for 1850, 1860, 1870, 1900, 1910, 1920, and for every subsequent census since 1940. How much better we can see into—and count—the past today!

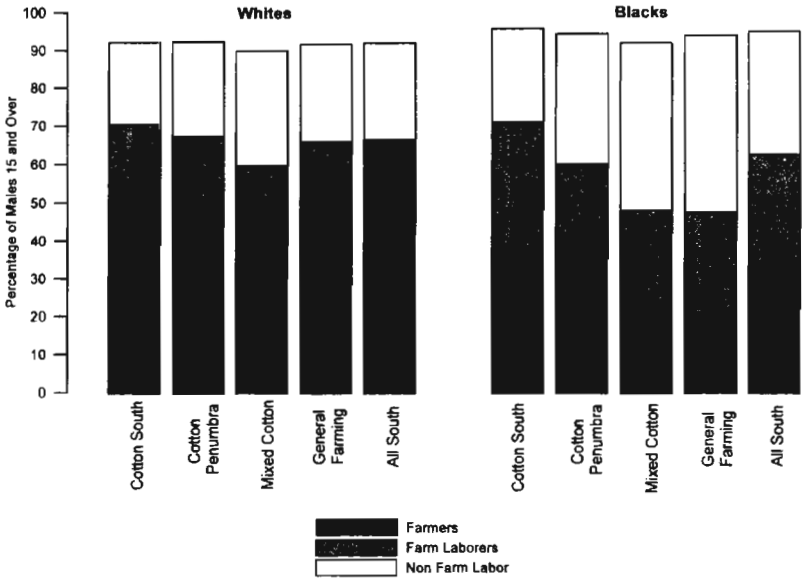

FIG. 4. Occupational distribution of males 15 and older by regions of the South, 1880.

was more than half of all adult males—were left with the option of working for wages. Figures 4 and 5 show the distribution of the labor force in 1880 for males and females grouped into three classes, farm operators, farm laborers, and those

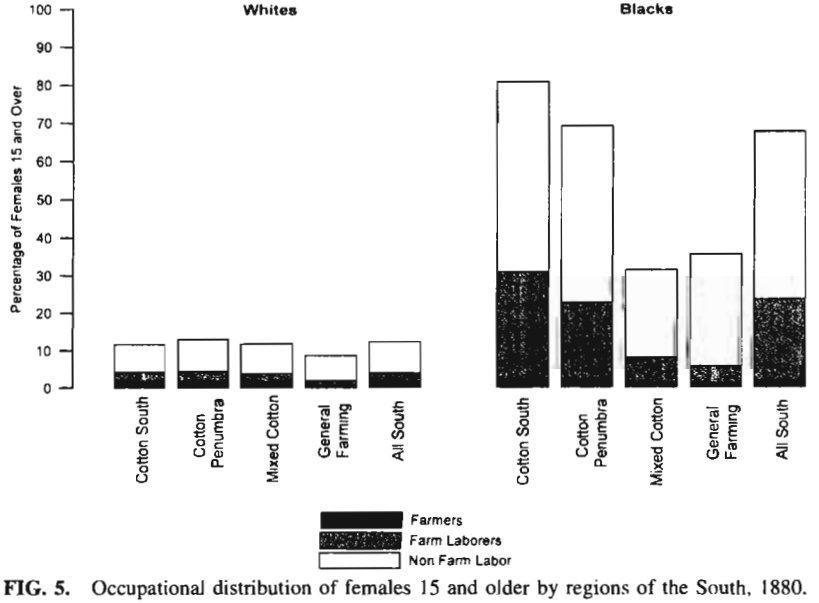

FIG. 5. Occupational distribution of females 15 and older by regions of the South, 1880.

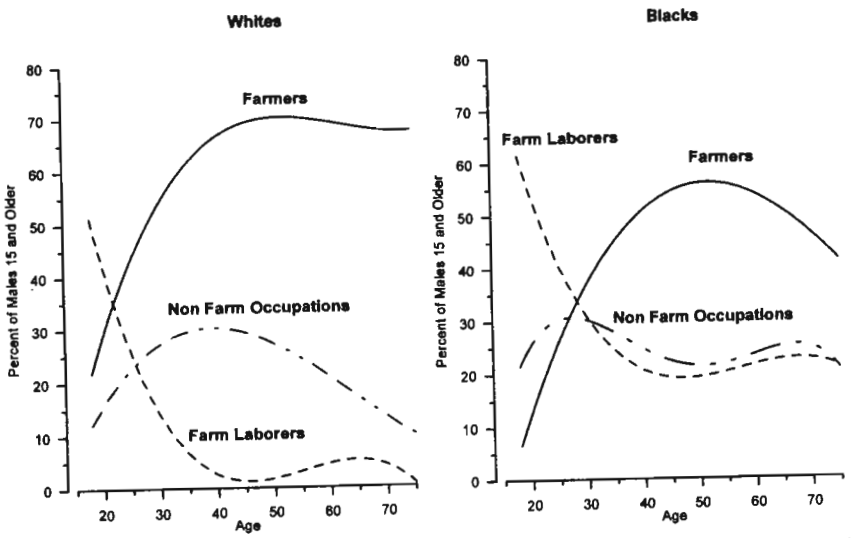

FIG. 6. Age distribution of males 15 and older in the labor force, Cotton regions of the South, 1880.

employed in nonfarm occupations.[13] Several contrasts between blacks and whites are immediately apparent from the graphs. First is the fact that although adult males of both races had about the same level of overall labor force participation, a significantly higher fraction of black males worked as agricultural laborers. Moreover, the prospects facing black males over the course of their working lives was far more constrained than those for whites. Figure 6 provides a comparison of labor force participation by race and age for the Cotton South, and Fig. 7 gives the same distribution for the two mixed-crop areas. If we think of these age distributions as synthetic cohorts, then it would seem that for a white male in either region, the prospect of becoming a farmer was reasonably good. By age 30, 60% of adult white males had become farm operators, and that fraction peaked at over 75% around the age of 60. Most whites did not work as farm laborers past the age of 40. By that time, virtually all white males were either farm operators or had found employment off the farm.

[13] The IPUMS occupation data for 1880 does not distinguish between owners and tenants in their classification of occupations; however, we can determine that fraction of all males 15 and over operating farms by the categories "farmer," "farm operator," or "farm manager." We used the 1880 occupation codes in the IPUMS file to assign workers to each group. Only those workers specifically listed as "farm laborers" were included in that category. This probably understates the extent of wage labor on farms—especially for blacks. A substantial number of people who lived in rural areas—though not necessarily on farms—were listed simply as "laborers." Under our definition, these people were included in the nonfarm labor force. Farm operators included dairymen, farm plantation overseers, farmers and planters, turpentine farmers and laborers, and stock drovers, herders and raisers. Respondents listing a "nonoccupational response" were excluded from the tabulation.

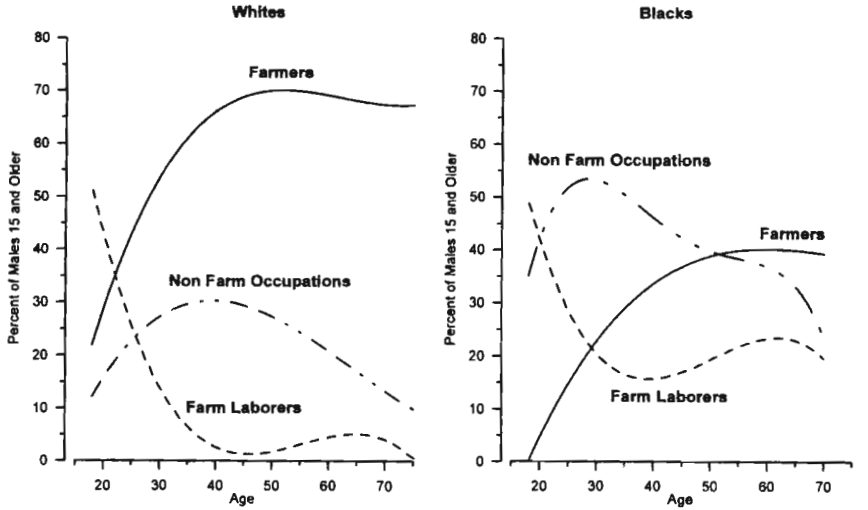

FIG. 7. Age distribution of males 15 and older in the labor force, Mixed Cotton and General Farming regions of the South, 1880.

For blacks the picture was much bleaker. While the data of Fig. 7 does suggest that blacks could succeed at becoming farm operators, the process was clearly much slower than for whites. Not until age 45 did the percentage of adult black males that reported themselves as farmers of some sort in the Cotton South reach 50%. Moreover, the fraction of black males that were farmers actually declined significantly after the age of 50. However, there is a problem using the synthetic cohort analysis here. Given the relatively brief time since emancipation, the decline in the fraction of older black males who were farmers may reflect the difficulty faced by exslaves in adapting to the "free" labor market with little or no experience. Even allowing for this factor, it is clear that the speed with which blacks obtained farms of their own was much slower than was the case for whites.

In contrast to white males, the fraction of blacks that were farm laborers in the Cotton South did not drop significantly below 20% for any age group. Outside the cotton regions the picture is more complex. Only about 35% of the blacks 50 and older in the General Farming Area had managed to become farm operators in 1880, and the proportion of men who were farm laborers rose noticeably after age 40. Nearly half of the men in their thirties had found employment outside of agriculture, suggesting that at least the younger generation of blacks might have chosen an alternative to agriculture. Whether or not that alternative was in fact one with a brighter future than those who remained farmers we cannot say. Sixty percent of the men employed outside agriculture were classified as "laborers." On the other hand, many of these men were still quite young and might have moved to a better occupation over time.

Even more dramatic than the comparison of occupational patterns of white and black males is the contrast in Fig. 5 between white and black women and between black women in and out of the cotton regions. In the Cotton South the labor force participation of black women was reported at between 70 and 80%, compared to a level of around 10% for white women. Away from the cotton areas, only 5 to 10% of the black women worked in the field, but this compares to the 2% of white women who were listed as agricultural laborers. Black women who did not work on the farm worked in nonagricultural occupations throughout the South. Most of these jobs were as "laborers" in the surrounding countryside, as "housekeepers" in a private household, or as a "laundress."[14] John Moen argues that white families consistently underreported labor by women on family farms, thus creating a serious undercount of white female labor (Moen, 1991). While we find Moen's argument plausible in view of the extremely low levels of female farm labor reported for whites, we have no direct evidence of how great such an undercount might have been. We doubt that the correction would erase the gap in female labor force participation, and it cannot account for the major differences in nonfarm occupations.

From the IPUMS 1880 population sample we have information on the labor force participation by family members within each family, presented in Table 2.[15] In the Cotton South, the fraction of family members 15 and older in the labor force among black families operating a farm was 62%; for whites it was 50%. In the General Farming Region the corresponding rates were 51% for blacks and 46% for whites. On black-operated farms in the Cotton South the spouse of the farm operator worked 23% of the time whereas on white-operated farms the spouse worked less than 1% of the time. Underscoring the labor intensity of cotton cultivation, black spouses worked on only 3% of the black-operated farms in the General Farming Region. Obviously, black farm families in the cotton regions had to devote a larger fraction of their time to farm labor to make ends meet than did their counterparts in other regions. Black families where the household head was not a farm operator fared no better. The participation rate of those 15 and older where the head of the household was a black farm laborer was 79% in the Cotton South and 76% in the Cotton Penumbra. In the Mixed Cotton and General Farming regions it was 65 and 57%, respectively. Black families in all areas of the South had higher participation rates than whites, but the differential was much smaller outside the cotton regions.

[14] These three occupations account for 96% of the black women reporting nonfarm occupations in the Cotton South. They also account for over 90% of the nonfarm jobs by black women in the diversified areas.

[15] The data are based on the household level data in the 1880 IPUMS sample. The race and occupational designation of families in Table 2 was determined by the race and occupation of the head of household. The labor force participation within each family is the number of family members 15 and older who are reported as in the labor force divided by the total number of family members 15 and older.

TABLE 2
Labor Force Characteristics by Occupation of Head of Family, 1880

Region	Percentage family members at work		Percentage families with spouse at work	
	White	Black	White	Black
Cotton South	47.0	67.1	1.5	26.6
Cotton Penumbra	47.8	64.7	1.6	21.6
Mixed Cotton Farming	46.1	56.3	1.3	10.2
General Farming	43.2	51.6	0.6	7.4
Whole South	46.1	63.6	1.2	21.7
Farm families:				
Cotton South	49.5	61.7	0.7	23.3
Cotton Penumbra	49.3	60.3	0.7	18.0
Mixed Cotton Farming	48.5	53.2	0.7	8.0
General Farming	46.4	51.0	0.2	3.2
Whole South	48.8	59.4	0.5	18.9
Farm laborers:				
Cotton South	58.9	78.7	5.5	36.1
Cotton Penumbra	58.8	76.2	4.8	33.0
Mixed Cotton Farming	56.8	64.8	2.3	16.1
General Farming	50.2	57.2	1.0	7.5
Whole South	55.3	74.8	3.1	30.9
Nonfarm families:				
Cotton South	56.6	66.4	2.8	27.8
Cotton Penumbra	54.7	77.3	3.2	22.1
Mixed Cotton Farming	53.6	66.0	5.5	10.4
General Farming	48.3	62.7	1.6	11.9
Whole South	54.2	71.4	2.3	20.9

THE POSTWAR DECLINE IN FOOD PRODUCTION

There was another change in southern agriculture after the war that was less visible than the reorganization of tenure arrangements, but equally profound. The production of food and grain crops per capita on the small farms in the cotton regions fell dramatically. As we noted in 1KF,

> the per capita production of corn, by far the most important food crop, fell to one-half its prewar level in 1870, and did not appreciably improve thereafter. The loss in corn supply was not replaced by other crops. . . . per capita outputs of ten other crops fell even more dramatically than did corn output. The total output of grains, expressed in units nutritionally equivalent to corn, averaged one-half the prewar level in the thirty years following the Civil War. (1KF, p. 151)[16]

[16] In 1860 the aggregate level of corn production per capita for the five cotton states averaged 29.6 bushels, and the average per capita production of other food crops was 6.3 corn-equivalent bushels, for a total of 35.8 bushels per capita of food grains. In 1880 production had declined to 15.6 bushels of corn, 3.9 bushels of other crops, and a total of 19.5 bushels of food grains. Almost as dramatic was

TABLE 3
Percentage Distribution of Farms by per Capita Food Residuals

	Per capita food residual equal to:			
	≤5 bushels	>5 and ≤10 bushels	>10 and ≤15 bushels	Over 15 bushels
Cotton South				
White farms	31.6	16.3	13.1	38.9
Black farms	40.9	21.8	13.9	23.4
Cotton Penumbra				
White farms	34.2	13.5	12.8	39.5
Black farms	38.9	17.3	12.7	31.1
General farming				
White farms	15.6	9.9	8.9	65.7
Black farms	32.7	12.2	10.2	44.9

The effect of this change in crop mix was not lost on contemporaries who argued that southern farmers should grow more food and less cotton. Yet farmers persistently ignored the advice and planted cotton to the point where they had to purchase food from a local merchant—often at credit prices far above the cost of producing food on the farm.

To illustrate just how pervasive the decline in foodstuffs had become, we calculated in 1KF the "food" produced on each farm in corn-equivalent units, and by subtracting the amounts of each crop needed for seed and animals on the farm we estimated the "residual" food available to the farm family.[17] Using the data from the whole South, we have recalculated the estimates of food residuals and the results are presented in Table 3 and summarized in Figs. 8, 9, and 10.[18] We regard 15 bushels of corn-equivalent food production per person as a conservative standard for food consumption. We lower this to 10 bushels per capita to avoid any possibility of exaggerating the extent of dependence on purchased food. By this overly cautious index a significant fraction of family farms did not grow enough food to meet the family needs. Both white and black farmers were susceptible to having food deficits. The fall in food production was not limited to the Cotton South, but the comparison of per capita food residuals in the figures suggests that the effects of abandoning corn production was more pronounced there than in the areas of mixed farming. The figures reveal that a far higher fraction of farms in the Mixed Cotton Region and the General Farming Region

the decline in the stock of swine from 1.64 per capita in 1860 to 0.88 per capita in 1880 (1KF, p. 152, Table 8).

[17] The procedure for calculating the food residuals is discussed in detail in Appendix E of 1KF. Note that we did not subtract a feed allowance for swine since we assumed they were not raised for market and represent corn consumed in the form of pork.

[18] Because of the small number of black-operated farms outside the cotton regions, we combined the data for the Mixed Cotton region with that for the General Farming area in Fig. 10.

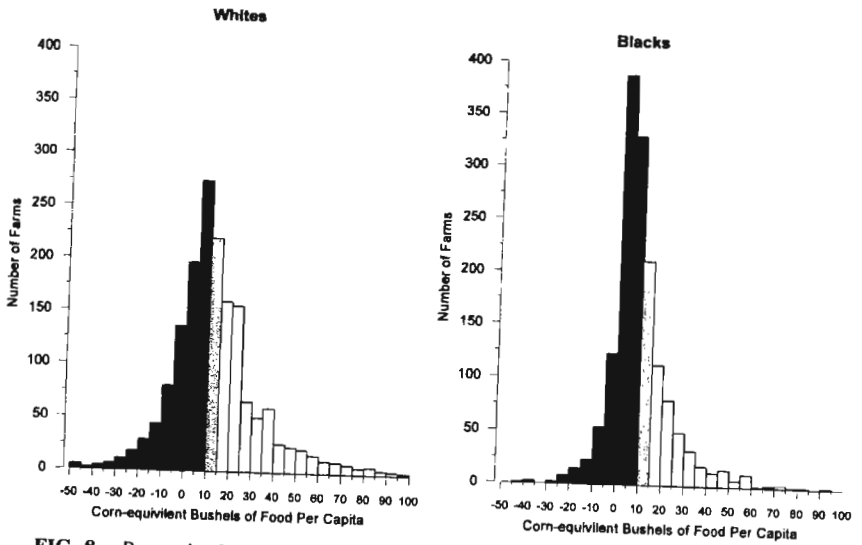

FIG. 8. Per capita food residuals on small-scale family farms, the Cotton South, 1879.

area were able to produce a "surplus" of food for consumption than was the case in the cotton areas.

TESTING THE LOCK-IN MODEL

In 1KF we supported the claims of many contemporary observers that the decline of food production and the associated disappearance of self-sufficiency in

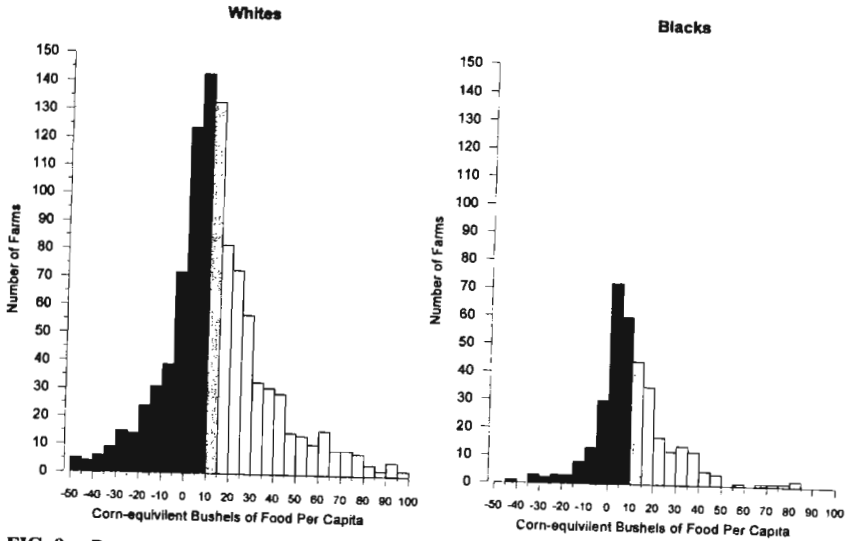

FIG. 9. Per capita food residuals on small-scale family farms, the Cotton Penumbra region, 1879.

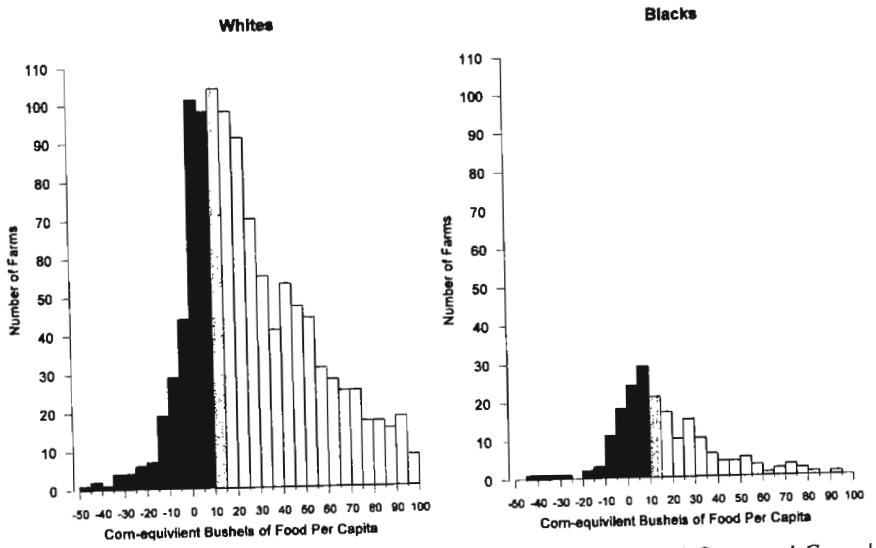

FIG. 10. Per capita food residuals on small-scale family farms, Mixed Cotton and General Farming regions of the South, 1879.

the Cotton South following the Civil War was a consequence of the credit and furnishing practices of rural merchants. The specific charge made was that "the merchant forced the farmer into excessive production of cotton by refusing credit to those who sought to diversify production" (1KF, p. 149). The terms of credit were exorbitant, and the merchant increased his business both of selling food to the farmer and cotton to the market by insisting that cotton be planted to the detriment of corn and other food stuffs (1KF, pp. 128–131, 162–164). After reviewing the qualitative evidence, we presented a dynamic economic model of the interaction between the merchant and the farmer. We supported the analysis with a calculation designed to demonstrate that a farmer shifting resoures from cotton to corn would gain roughly 13 bushels of corn for every 100 pounds of cotton forgone.[19] We concluded that a move to more diversified farming would surely be profitable for any farm purchasing food at credit prices. Because the farmer ended each year with insufficient food reserves and insufficient cash to purchase the necessary food at cash prices, he was forced into borrowing to feed his family during the subsequent year. We described this as "debt peonage," and we concluded that many farmers, whites as well as blacks, were effectively locked-in to cotton production (1KF, p. 162).

Was our back-of-the envelope calculation accurate? Enhanced computer capabilities allow us to conduct a more thorough test of the data to see whether

[19] This discussion is contained in Chap. 8 of 1KF. The economic model was elaborated in Ransom and Sutch (1975), and a rejoinder to critics of the model can be found in Ransom and Sutch (1979a). A discussion of the rural furnishing business is presented in Chap. 7 of 1KF.

farmers were "locked in" to cotton. The calculation of the marginal transformation rate between corn and cotton reported in 1KF was based on the following assumptions and observations:

1. The binding factor constraints faced by the farm family were the amount of labor and capital (primarily working animals) they could devote to farming. After reviewing the contemporary literature, we assumed that, at the margin, the farmer who reduced cotton planting by 1 acre "would release sufficient labor and capital to cultivate between 1.67 and 2 acres of corn" (1KF, p. 166).
2. We used the *average* yields of cotton and corn per acre on small-scale family-operated farms as a measure of the yields at the *margin.* This would minimize the gain to a shift toward corn (1KF, p. 351, n. 60). The calculation used averages calculated across all of the small-scale family farms from the Cotton South.
3. We assumed that the value of the cottonseed sold offset the cost of ginning the cotton (1KF, p. 167).
4. We used contemporary sources to estimate that the value of the corn fodder was equivalent to between 10 and 18% of the value of the grain (1KF, p. 167).
5. We used averages of the USDA's reported farm-gate prices of cotton and corn calculated over the three years 1878, 1879, and 1880 and the five cotton states to place a dollar value on the marginal gain for self-sufficient farms (1KF, p. 167).
6. We used the average markup of credit prices over farm-gate prices for corn in Georgia averaged over the years 1880 to 1889 to place a dollar value on the marginal gain for a farmer forced to buy corn at credit prices (1KF, pp. 129, 167).

For this report we use the sample of farms from the Cotton South to estimate the physical transformation ratio for each farm individually. In that way we can examine the distribution of the calculated rate of transformation and identify farms that were "locked-in" to debt peonage. To do this we begin by calculating the number of acres of corn that could be cultivated by the resources released from 1 acre of cotton. Our new estimate is a direct test of assumption number one, using the sample of farms rather than contemporary agricultural journals as the source of information. The estimate is based on the coefficients of a statistical regression that includes data from farms that were presumably free to choose their cotton and corn mix. The dependent variable is the total value of farm production in 1879 reported to the Census, and the independent variables are the number of acres of cotton, the number of acres of corn, and the number of acres in other crops. Dummy variables for each of the 27 counties in the Cotton South (less one) were included to control for fixed effects. The estimator used was weighted median regression.[20] The weights adjust for different sampling frequencies in the several subregions of the Cotton South.[21] The median regression

[20] In STATA the command is *qreg* with analytic weights (default quantile regression).

technique estimates the median of the dependent variable rather than the mean and is preferable to ordinary least-squares regression in this context because it is less influenced by outliers.[22] Only farms with a food residual greater than or equal to 20 bushels of corn equivalents were included in the regression (which was left with 1,443 observations). This restriction excludes farms that might be locked into excessive cotton production.[23] The coefficients of the three acreage variables give the typical value of output per acre from an acre of cotton, of corn, and of other crops, respectively. We take the ratio of the coefficient on cotton acres to the coefficient on corn acres as a measure of the number of acres of corn that could be cultivated by releasing an acre of cotton. From contemporary reports in agricultural periodicals, we had learned that this number was widely believed to be between 1.67 and 2. Our regression produced an estimate of 1.97. Given the precision of our estimates, we can reject the null hypothesis that the ratio of the two coefficients was 1. If we drop the county dummies, the regression gives an alternate estimate of 1.58. We cannot reject the hypothesis that the ratio is 1.67. We take these results to support the first of the six assumptions.

The midpoint between 1.58 and 1.97 is 1.775. We use this number as a measure of the number of acres of corn that could be grown with the same labor and capital as 1 acre of cotton.[24] Making assumptions 3 and 4 concerning cottonseed and corn fodder, we next calculated for each farm that grew both cotton and corn the number of additional *bushels* of corn that could have been produced by reducing cotton production by *one bale.* This is the physical transformation ratio. We calculate this for each small-scale family-operated farm in the Cotton South.[25] The percentile distribution of the physical transformation ratio for these farms is provided in Table 4. The median farm could have

a discussion of the sampling procedure. Also see 1KF, Appendix G. Our weighting procedure is different from the one described in 1KF, pp. 291–294. It is easier to implement and the differences from the results produced with the more elaborate procedure used for 1KF are trivial.

[22] The census data report extreme (and incredible) values for output and other variables on several farms in our sample. When calculating the results presented in 1KF we removed a small number of outliers manually using our informed judgment about what constituted an "outlier." Since we did not retain the underlying computer output, we no longer can document which farms were deleted for the statistic calculated. Median regression obviates the need for a judgmental treatment of outliers. Nearly identical results to those reported in the text are produced using robust regression estimators (the STATA command *rreg*).

[23] Our procedure estimates the slope of the production possibilities frontier for farms that were free to choose their corn, cotton mix. See Ransom and Sutch (1975) for a presentation of the argument using the familiar textbook device of the production frontier.

[24] Actually we prefer the 1.97 ratio from the equation that controlled for county-level fixed effects. We use 1.775 to bias the results against our argument. Note that this is lower than the 1.835 ratio we used in 1KF.

[25] Since the census did not report fractional acres or fractional bales of cotton, we excluded farms producing zero or one bale of cotton and farms reporting zero or one acre of corn to avoid the rounding problems associated with fractional output and fractional acres. Only 38 farms were dropped for this reason.

TABLE 4
The Physical Transformation Ratio on Small-Scale Family-Operated Farms,[a] Percentile Distribution in the Cotton South, 1879

	Number of potential corn acres from one less acre of cotton		
Percentile	1.58	1.775	1.97
1%	5.6	6.3	7.0
5%	16.7	18.7	20.8
10%	21.6	24.3	26.9
25%	33.8	37.9	42.1
Median (50%)	50.4	56.7	62.9
75%	72.0	80.9	89.8
90%	108.1	121.4	134.7
95%	135.1	151.8	168.4
99%	187.6	210.8	233.9

Note. N = 2,676, weighted percentiles.

[a] The physical transformation ratio is the number of bushels of corn that might have been produced by reducing cotton production by 1 bale.

produced 56.7 additional bushels of corn by giving up a bale of cotton. Would this have been worthwhile? That, of course, depends upon the value of corn and cotton to the farmer contemplating a shift of labor and capital toward corn.

The next step is to calculate the value of a bale of cotton produced. Since the output of cotton was reported in bales and the bale weights varied from farm to farm, a direct estimate of the value of a bale is probably preferable to an estimate based on an assumed weight of a bale and the USDA's reported December 1 farm-gate price of cotton per pound. That is how we did the calculation in 1KF. For our revisited calculation we assume a well-functioning South-wide market for cotton. Such a market would produce only a small variation in the farm-gate prices received. Again, we use a weighted median regression estimator. The dependent variable, as before, is the value of farm output in 1879. The independent variables are in this case the number of bales of cotton produced in 1879, an output proxy for all other output, and the controlling county dummies. The cotton-equivalent output proxy for other crops is defined as the number of acres in other crops times the cotton yield per acre on the farm. The regression was restricted to the small-scale family-operated farms (producing at least two bales of cotton) that were the focus of the lock-in discussion in 1KF (N = 2,719). The estimated value of a bale of cotton using this procedure was $47.37 with a 95% confidence interval of $45.57 to $49.17. In 1879 the average weight of a "running bale" was 454 pounds (Holmes, 1912, p. 7). This suggests that these cotton farmers received about 10.0 to 10.8 cents per pound. The USDA reported the farm-gate price of cotton to have been 10 cents a pound in 1879 for Georgia, Mississippi, and Louisiana, and 11 cents a pound in South Carolina and Alabama

(U.S. Dept. of Agriculture, 1927).[26] Our methodology seems to produce a reliable estimate of the price received by the farmer for a bale of cotton.

A similar equation, restricted to those small-scale family-operated farms with food residuals greater than or equal to 20 bushels of corn equivalents, estimated the farm-gate price of corn to have been 67.8 cents per bushel.[27] That price would be relevant to a farmer who was selling corn. To such a farmer 56.7 bushels of corn (the median corn-equivalent of a bale of cotton) would be worth $38.44. Since $38 is far below the $47 dollar value of a bale of cotton, we conclude that the median small-scale farmer was not selling corn.

If a farmer bought corn for cash, he could expect to pay about 18% more than the farm-gate price of cotton (1KF, p. 352, n. 66). That price would make the 56.7 bushels of corn worth $45.36. This is only a few cents below the lower limit of the 95% confidence level of the price of a bale of cotton. We conclude that the median small-scale farmer was quite close to self-sufficiency.

The farmer who had to purchase corn at the credit price could expect to pay 53% more than the farm-gate price of corn, or $1.04 per bushel (1KF, p. 167). At that price any farmer with a physical conversion ratio greater than 45.5 bushels of corn per bale of cotton would have been better off to increase corn production. Sixty-four percent of the farms had a conversion ratio greater than that. These are the farms that potentially were locked-in. But how many of them actually were?

Before we proceed to explore that question, we wish to point out our unease with the previous calculation. Corn prices were subject to larger local variation than cotton prices. Using a Cotton-South-wide average price of corn might be inappropriate for calculations applied on a farm-by-farm basis. What we do instead is calculate a variable for each farm that does not involve a corn price. Instead it measures the "shadow price" of corn that might be produced on the farm's cotton land assuming that the labor and capital inputs produce as much revenue growing corn as they might have produced growing cotton. In what follows we call this statistic CVC, the corn value of cotton at the producer's margin. CVC is defined as the farm-gate price of a bale of cotton ($47.37) divided by the farm's physical transformation ratio. This measure gives the value of the cotton in terms of the equivalent price per bushel of corn. If a farm's CVC was below the farm-gate price of corn, the farm should specialize in cotton production. The higher this shadow price, the more attractive would be corn production. If CVC exceeds the purchase price of corn (either cash or credit price as the case might be), then the farm should grow less cotton and more corn.

Rather than make a guess at the local corn prices faced by these farmers, we

[26] A weighted average for the five cotton states is 10.3 cents per pound. Holmes put the national average at 10.2 cents (Holmes, 1912, p. 7).

[27] The USDA reported farm-gate corn prices for 1879 to have ranged from 76 cents in Louisiana, 75 cents in South Carolina, 70 cents in Georgia, 66 cents in Alabama, to 62 cents in Mississippi (Clark, 1907, p. 14). A weighted average for the five states is 68.1 cents per bushel.

TABLE 5
Percentage Distribution of Farms Arrayed to Show the Relationship of CVC to Food Residual per Capita,[a] Small-Scale Family-Operated Farms in the Cotton South, 1879

Corn value of cotton, dollars per bushel	Food residual, bushels of corn equivalents per capita				
	FR <= 5	5 < FR <= 10	10 < FR <= 15	15 < FR	Total
CVC is less than $0.63	6.2	4.8	4.9	15.9	31.7
CVC is between $0.63 and $0.73	1.5	1.6	1.3	3.5	7.9
CVC is between $0.73 and $0.83	*2.4*	*2.1*	1.5	3.5	9.5
CVC is between $0.83 and $0.93	*1.4*	*1.1*	0.5	2.7	5.8
CVC is greater than $0.93	**20.6**	**9.7**	5.9	8.8	45.1
Total	32.2	19.3	14.1	34.4	100.0
Median CVC ($)	1.17	0.94	0.78	0.68	0.84
Percentage black	50.8	50.7	40.9	29.5	42.0
Percentage of acreage in cotton	54.8	50.8	47.1	43.1	48.9

[a] The CVC is defined as the dollar value per bushel of corn that can be produced by the resources freed from growing one less of cotton.

explore the relationship between CVC and the per capita food residuals across the small-scale family-operated farms in our sample. A combination of a high corn value of cotton and a low or negative food residual would suggest that the farmer was caught in the trap of debt peonage.

In 1KF we claimed that "(at) the very least, an average of 10 bushels of corn per year would be required to provide the minimal needs of each family member; a more plausible estimate would be 15 bushels per household member" (p. 159). Following this rule we partitioned the small-scale family-operated farms in the Cotton South into four categories, those with 5 or fewer bushels, those with more than 5 but with 10 or fewer bushels, those with more than 10 but with 15 or less, and those with more than 15. We consider the first two classes as not self-sufficient, the fourth class as self-sufficient.

We have also partitioned the farms by CVC, basing our categories on conservative rules of thumb. We consider any farm with a CVC between 63 and 73 cents per bushel to be operating sufficiently close to the farm-gate price of cotton (68 cents) to be operating efficiently. We consider any farm with a CVC less than 63 cents or greater than 93 cents to be operating inefficiently. Farms with a CVC between 73 cents and 93 cents were operating close to the cash purchase price of corn (80 cents).

Table 5 gives the percentage distribution of farms arrayed by four classes of self-sufficiency and five ranges of values for CVC. Farms included in the highest CVC category and the lowest two food residual categories (indicated by bold-

faced entries in Table 5) can be said to have been locked-in to debt peonage. They were not self-sufficient but could have produced corn with a value greater to them than the credit price of corn. These farms are operating with an inefficient crop mix. As a consequence, a rather surprising amount "deadweight social loss" is suggested. By this definition 30.3% of all the small-scale, family-operated farms in the Cotton South were locked-in. We have argued elsewhere, however, that the farms included in the third and fourth CVC categories, and the two lowest food residual categories (indicated by italics in Table 5), in all likelihood, were locked-in as well. These farms were not self-sufficient and they had to purchase corn. If they had to pay the credit price, the merchant could have forced them to plant more cotton then they would have wished. This coercion lowered their CVC toward the revenue-maximizing level. However, the social increment generated by the forced specialization was taken by the merchant in the form of exorbitant credit.[28] How many of the farms with a CVC between 63 and 93 cents should be considered locked-in and forced to specialize can only be guessed.[29] The four italicized figures, taken together, represent 7.0% of the total.

Locked-in farms were not the only victims of the merchants' power over credit. Some farmers avoided the need to purchase corn by adopting an autarkic strategy of self-sufficiency in the production of food. With this "safety-first" approach the farm grew cotton, if at all, as a "surplus" crop.[30] Such a strategy, however, might have required them to produce inefficiently. If their CVC was less than 63 cents, they could gain by growing more cotton. Presumably, they deliberately resisted this market signal because of the danger of falling into the merchant's trap. We classify any farm with a food residual greater than 15 bushels and a CVC of less than 63 cents as inefficient autarkic farms. They account for 15.9% of the total. Together with the inefficient locked-in farms, we have an astonishing 46.2% of the farms operating inefficiently as a consequence of the credit system, those who were inefficiently producing too much cotton and paid exorbitant credit prices and those who avoided the need for credit only by inefficiently producing too little cotton.

A test of the lock-in hypothesis can be stated as follows. For farms that were not self-sufficient the median value of CVC should be high. For farms that were

[28] See our discussion of this mechanism in Ransom and Sutch (1975, p. 73). There we predicted on theoretical grounds that most of the locked-in farms would be pushed toward an efficient cotton–corn mix. That seems not to have been the case, and the deadweight allocative inefficiency appears to be larger than we once imagined.

[29] Farms that were not self-sufficient might have been locked-in, but they also might have simply faced a physical transformation rate, given their soil, expertise, and capital, that made it efficient for them to specialize in cotton and to purchase grain at the cash price. Certainly we can say that those farms with a CVC less than 63 cents and a food deficit were likely to be such efficient specializers. Table 5 reveals that at least 11.0% of the farms meet that definition. The uncertainty is about the number of creditors with CVC in the 63 to 93 cent range.

[30] Wright and Kunreuther (1975) describe the safety-first strategy. For our discussion of this class of farmers see Ransom and Sutch (1975, pp. 412–433; 1979a, pp. 73–75).

TABLE 6
Weighted Median of Total Acres by Tenure and Race of Farm Operator, Cotton South, 1880

	Race of farm operator		
	White	Black	Total
Owner operator	160 [1934]	80 [404]	150 [2338]
Rented for cash	54.5 [238]	30 [519]	32 [757]
Rented for shares	30 [504]	30 [983]	30 [1487]
Total	120 [2676]	35 [1906]	70 [4582]

Note. Numbers in brackets represent the number of observations.

self-sufficient in food, the value of CVC should be close to the farm-gate price of corn (68 cents). We take a food residual of 5 bushels or less per person to be evidence of a lack of self-sufficiency and a residual greater than 15 bushels per capita to be evidence that the farm could avoid purchasing grain. Our results, presented as median values of CVC, are displayed in the lower panel of Table 5. We conclude that the lock-in was operating. Farms with food deficits were valuing corn at $1.17 per bushel while those with adequate output to meet their own needs were allocating their labor and capital as if they were valuing corn at 68 cents per bushel.[31]

PROB(IT)ING TENURE CHOICE

The sample of southern farms from the 1880 agricultural census was matched with the enumerators' manuscripts from the 1880 population census. The agricultural census did not record the race of the farm operator. The population census did not record the tenure arrangements under which a farm operator worked. Only by laboriously matching the two sets of schedules were we able to obtain information to cross tabulate race and tenure. From our sample it was easy to show that landownership remained in white hands. Only 6.7% of the land in farms in the Cotton South was owned by blacks. Most black farm operators rented their farms either for cash (about one-third) or for a share of the crop (two-thirds) (1KF, Table 5.1, p. 84). It is also the case that owner-operated farms were typically much larger than rented farms. Using the modern version of the sample of farms from the Cotton South, we show that the median number of acres was larger for owned farms than for rented farms and larger for cash-rented farms than for sharecropped farms. The results are presented in Table 6. If we restrict our attention to only tilled acres (thus excluding meadows, pastures, woodlands,

[31] This last result (actually 68.279 cents per bushel for farms with food residuals greater than 15 bushels) is quite close to our estimate of the farm-gate price of corn (67.770 cents). This result, however, should not be surprising. Recall that we estimated the farm-gate price of corn for the median farm in a regression that included only farms which had food residuals of 20 bushels or greater. The median CVC for those farms is 67.793 cents. This last figure is simply an alternative way to estimate the median farm-gate price of corn from the same set of farms.

TABLE 7
Weighted Median of Tilled Acres by Tenure and Race of Farm Operator, Cotton South, 1880

Tenure	Race of farm operator: White	Race of farm operator: Black	Total
Owner operated	40 [1934]	27.5 [404]	40 [2338]
Rented for cash	30 [238]	30 [519]	30 [757]
Rented for shares	25.5 [504]	30 [983]	30 [1487]
Total	35 [2676]	30 [1906]	30 [4582]

Note. Numbers in brackets represent the number of observations.

and "other" acres), we find the same pattern. This calculation is presented in Table 7.

Large farms were more likely to be owner-operated than small farms. More accurately stated, tenancy seemed to have been a way to provide small farms to family farmers. Figure 11 shows the relationship. Note that the number of tilled acres is plotted on a logarithmic scale on this chart. For farms larger than 30 tilled acres the ownership rate rises sharply with farm size. Large farms were also more likely to be operated by white rather than by black farmers. This may have been because of the whites' greater experience with large-scale operations. Very few slaves were given the opportunity to manage large-scale farms. Alternatively, this might reflect the fact that whites had access to bank mortgage and broker credit at a time when blacks did not. Perhaps the pattern is attributable to some other characteristic of farms that was correlated with, but not directly related to,

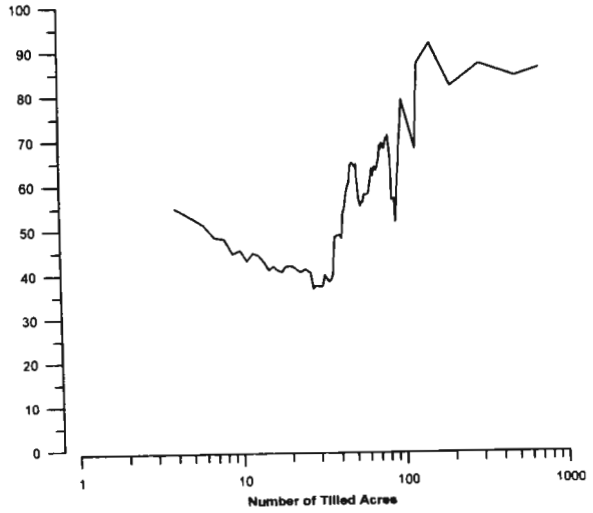

FIG. 11. Percentage of farms operated by owner, Cotton South, 1879.

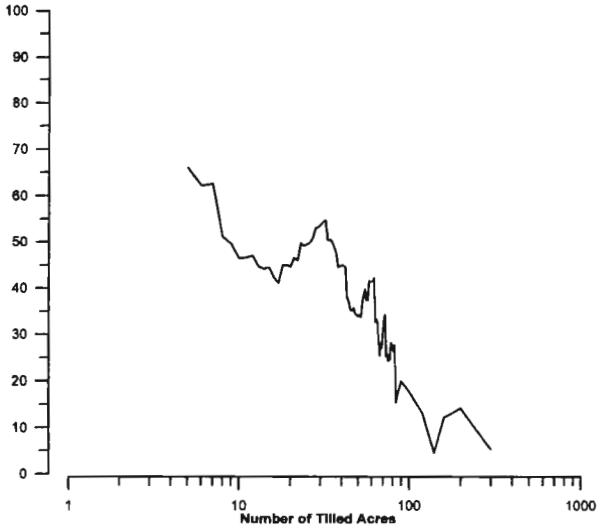

FIG. 12. Percentage of farms operated by blacks, Cotton South, 1879.

race. Whatever the cause, the relationship between farm size and the race of the operator is a strong one. Figure 12 employs the Cotton South sample to illustrate this.

The two figures present a problem in interpreting the relationship between race and tenure. Although we doubt it, it is mathematically possible that the difference in ownership rates between whites and blacks was due not to the race of the operator but to other characteristics of the owner such as managerial experience, illiteracy, or age. In 1974 our doubts were so strong that we did not consider such a possibility. Had we done so, our capacity to control for these confounding variables would have been limited by both the state of the art and the capabilities of our computers.[32]

Today such a problem is routinely handled by using some form of discrete variable estimator such as the probit model. For example, we might wish to predict the probability that a farm operator would own his own farm using not only race but also farm size (reflecting the need for managerial experience), the farmer's age (reflecting both his experience and, perhaps, his accumulated wealth), the size of his family and the number of family farm workers, his literacy, and his interstate mobility (reflecting perhaps his willingness to assume risk). Results of estimating a weighted maximum-likelihood probit regression

[32] In 1974 the Berkeley computer took about 20 min to perform an ordinary regression with five or six variables and several thousand observations. The probit estimator for discrete choice models had yet to be introduced.

TABLE 8
Determinants of Owner Operation, Cotton South, 1880, Maximum-Likelihood Weighted Probit Regresssion

Independent variable	Without county dummies		With county dummies	
	dF/dx	z	dF/dx	z
Age	0.02018	53.9	0.02103	54.2
Age squared	−1.528E-04	−37.9	−1.567E-04	−37.5
Tilled acres	0.00249	95.8	0.00293	105.9
Tilled acres squared	−1.900E-06	−75.7	−2.140E-06	−82.4
Number of people in the house	0.01067	27.4	0.00858	21.3
Number at work on farm	−0.02338	−33.8	−0.01918	−26.3
Mover[a]	0.07172	40.3	0.03292	13.6
Illiterate[a]	−0.13452	−61.1	−0.13813	−60.7
Black[a]	−0.42428	−198.2	−0.41708	−180.9

	All	White	Black
Actual percentage of owners	53.1	71.1	21.2
Predicted percentage of owners without county dummies	53.6	71.1	21.4
Predicted percentage of owners with county dummies	53.7	71.1	21.3

Note. Dependent variable is equal to one if the farm is owner-operated, zero otherwise. Number of observations = 4,346.

[a] This is a "dummy variable" equal to one if true. With a dummy variable the value of dF/dx is for a discrete change in the dummy variable from zero to one. "Mover" is true if the farm operator resides in a state other than his state of birth.

that predicts ownership status with a single specification along these lines is presented in Table 8.[33]

All of the predictors have the anticipated sign and seem to be relatively powerful. The strong negative coefficient on the dummy variable "black" indicates that even after controlling for the other variables, blacks are less likely to be owner-operators than whites. At the bottom of Table 8 we present a comparison of the actual percentage of farms that were owner-operated with the fraction predicted by the regression model. Note that the model—using only a race dummy—not only does well overall but also predicts both white- and black-ownership rates rather well.

[33] The regressions were restricted to farms with greater than or equal to 10 tilled acres. Maximum-likelihood probit is the *dprobit* command in STATA. Table 8 contrasts the results of the same regression model with and without controls for county-level fixed effects. In the second panel a separate dummy variable was included for 26 of the 27 counties included in the Cotton South sample. A chi-squared test suggests that the joint significance of the county controls is highly significant ($\chi^2(26) = 309$), but, consistent with our earlier conclusion that the results reported for the Cotton South were uniform across subregions, the coefficients of all of the other variables (except "mover") were unaffected by the county dummies. In particular, the key variable "black" retains its magnitude.

TABLE 9
Determinants of Owner Operation, by Race, Cotton South, 1880, Maximum-Likelihood Weighted Probit Regression

Independent variable	White (2,540 observations)		Black (1,806 observations)	
	dF/dx	z	dF/dx	z
Age	0.02322	60.9	0.00444	9.4
Age squared	−1.761E-04	−43.0	−3.030E-05	−5.9
Tilled acres	0.00212	80.8	0.00152	16.6
Tilled acres squared	−1.580E-06	−68.8	3.250E-06	7.0
Number of people in the house	0.00814	19.4	0.00362	7.9
Number at work on farm	−0.02251	−29.2	−0.00032	−0.4
Mover[a]	0.00630	2.5	0.05809	20.6
Illiterate[a]	−0.15449	−56.9	−0.05686	−22.1

	White	Black	Black	White
Actual percentage of owners	71.1	*21.2*	21.2	*71.1*
Predicted percentage of owners	71.0	*55.0*	21.6	*32.8*
Percentage of predicted gap explained by:				
Racial difference in coefficients	—	*67.6*	—	*77.4*
Differences in charateristics other than race	—	*32.4*	—	*22.6*

Note. Dependent variable is equal to one if the farm is owner-operated, zero otherwise. Number of observations = 4,346.

[a] This is a "dummy variable" equal to one if true. With a dummy variable dF/dx is for a discrete change in the dummy variable from zero to one. "Mover" is true if the farm operator resides in a state other than his state of birth.

We can extend this exercise one further step by estimating two independent regressions, one for whites and one for blacks. As it turns out, the coefficient estimates from the two regressions are very different, particularly on the polynomial in age. The results are compared in Table 9. Both regressions do well in predicting the respective ownership rates. The predicted gap between white and black ownership was about 50 percentage points (white 71.0%, black 21.6%). The two italicized columns in the lower panel represent out-of-sample predictions. If we use the estimated coefficients from the regression for the white farm operators to estimate the ownership rates of blacks, we can determine how much of the ownership gap was due to race rather than differences in the other characteristics included in the model. In a sense, we are asking which farms would be owned rather than rented by blacks had they been identical in all the reported characteristics except that the farm operator was white rather than black. The results of this calculation are presented in the left-hand italicized column in Table 9. We find that the black ownership rate would have been 55% rather than the actual rate of 21% for African Americans. By this measure 67.6% of the gap

TABLE 10
Determinants of Rental Contract, Rented Farms, Cotton South, 1880, Maximum-Likelihood Weighted Probit Regression

Independent variable	dF/dx	z
Age	−0.00805	−17.9
Age squared	8.560E-05	17.3
Tilled acres	−0.00071	−15.4
Tilled acres squared	8.680E-08	1.1
Number of people in the house	0.00470	10.0
Number at work on farm	−0.01674	−20.6
Mover[a]	−0.06719	−24.4
Illiterate[a]	0.04067	16.2
Black[a]	0.00234	0.9

	All	White	Black
Actual percentage of sharecroppers	71.8	75.4	69.4
Predicted percentage of sharecroppers	74.9	75.5	69.4

Note. Dependent variable is equal to one if the farm is sharecropped and equal to zero if rented for cash. Regression includes county dummies. Number of observations = 2,143.

[a] This is a "dummy variable" equal to one if true. With a dummy variable dF/dx is for a discrete change in the dummy variable from zero to one. "Mover" is true if the farm operator resides in a state other than his state of birth.

between white and black ownership rates is explained by race, that is, by the differences in the estimated coefficients between the races. Only 32.4% of the gap is due to the difference in the measured characteristics of the two groups of farm operators. The right-hand italicized column of Table 9 presents an alternative estimate of the same decomposition which uses the black coefficients rather than the white coefficients. By the alternative measure, 77.4% of the gap is explained by race and only 22.6% by differences in the characteristics. It seems safe to argue that the racial differences we observed in ownership are predominately due to race, that is, to racial discrimination in land and credit markets (and possibly to other nonracial differences not included in the regression equations).

What about the distinction between sharecroppers and cash renters? Once a farmer was excluded from (or excluded himself from) farm ownership, what determined his choice of rental contracts? Was race a factor here as well? We can approach this question with the same methodology. This time the dependent variable would be equal to one if the farmer was a sharecropper and equal to zero if he was a cash renter. The regression would then be restricted to renters. The model with a dummy for race is displayed in Table 10. The model with separate regressions for whites and blacks is presented in Table 11.

The first point to notice is that there is not much difference between white and black renters in the percentage of farms sharecropped. At the bottom of Table 10 we discover that white renters sharecropped 75% of the rented farms while black

TABLE 11
Determinants of Rental Contract, by Race, Rented Farms, Cotton South, 1880, Maximum-Likelihood Weighted Probit Regression

Independent variable	White (708 observations)		Black (1,420 observations)	
	dF/dx	z	dF/dx	z
Age	−0.01462	−19.1	−0.00504	−8.2
Age squared	1.445E-04	16.7	6.840E-05	10.2
Tilled acres	−0.00086	−16.5	−0.00051	−3.0
Tilled acres squared	1.760E-07	2.7	7.570E-06	6.5
Number of people in the house	0.00979	12.8	0.00295	4.6
Number at work on farm	−0.00545	−3.8	−0.02403	−22.5
Mover[a]	−0.01140	−2.7	−0.10924	−28.4
Illiterate[a]	0.09959	26.2	−0.00069	−0.2

	White	Black	Black	White
Actual percentage of sharecroppers	75.4	*69.3*	68.1	*69.9*
Predicted percentage	75.4	*71.6*	68.1	*72.9*
Percentage of predicted gap explained by:				
Racial difference in Coefficients	—	*47.3*	—	*34.5*
Differences in characteristics other than race	—	*52.7*	—	*65.5*

Note. Dependent variable is equal to one if the farm is sharecropped and is zero if rented for cash. Both regressions include county dummies. [a] This is a "dummy variable" equal to one if true. With a dummy variable dF/dx is for a discrete change in the dummy variable from zero to one. "Mover" is true if the farm operator resides in a state other than his state of birth.

renters sharecropped 69%. Not surprisingly then, the coefficient on the dummy variable "black" is small. The second point is that illiteracy seems to have been a much stronger barrier to cash renting for whites than for blacks (see Table 11). Third, the willingness to take risks (as measured by the "mover" variable) seems to have been a more important inducement to cash renting for blacks than for whites. This echoes the finding reported in Table 9 that risk willingness was a stronger indicator of ownership for blacks than for whites. Finally, when we perform the counterfactual of applying the white coefficients from Table 11 to the blacks in the sample, we find that 71.6% of them would have been sharecroppers rather than the actual incidence of 69.3%, which is still below the whites' 75% rate. If sharecropping was a "lower rung" than cash renting on the tenure ladder as many contemporaries reported, then the landless whites in our sample seem to have faired worse than the blacks. Since black renters were about twice as numerous as white renters, this result is not so surprising. Highly capable black farmers, denied the chance to own a farm, were obliged to rent for cash or a share of the crop. Equally capable white farmers could own land and thus the white renters were on average less capable than black renters. In a racist world, it all makes a twisted sort of sense.

CONCLUSIONS AND REFLECTIONS

We could pursue other questions with modern methodology, powerful software, and fast computers—both the old questions that we originally raised in 1KF and new questions—using the resurrected sample of farms. However, we have no desire to exhaust the subject. Our limited objective here is to demonstrate how greatly the power of our empirical tools has grown in the last 25 years and to remind the reader of the unexploited potential of the 1880 sample and the other new microdata sets. We hope that others will be as intrigued as we are with this potential and will return to give some additional attention to this key moment in American history.

We are pleased, of course, that 1KF is still viewed as a valuable contribution to economic history and that its message regarding the strength of black agency at a most difficult and dangerous moment still has resonance. On the other hand, we have long felt some disappointment that our contribution did not stimulate much cumulative research by economic historians on the period immediately following emancipation. John Lofland, the sociologist, was speaking of his field but he might have been speaking of economic history when he diagnosed a plague of "analytic *interruptus*" (Kemper, 2000). Scholars, with their emphasis on novelty and originality, far too often leave a topic half investigated as they rush on to tackle other "under studied" topics. We are certainly guilty of this, but so are many of our colleagues. New, even startling, findings are often accepted before they are subjected to impartial testing. Replications are rarely published. We think the field loses something when this happens. So we would end this revisit to the South of 1880 with a few suggestions for continued research.

One task that we chose not to undertake in 1974 was to use the sample to estimate a production function for southern agriculture. We judged the quality of the labor data available from the original census source to be too poor to allow us to make reliable calculations or to reach conclusions we could offer with any confidence. After reexamining this issue in preparation for this article we confirmed our original judgment.[34] The data we collected on labor inputs was insufficient. Neither improvements in software, computer technology, nor investigatorial ingenuity can make bad data good. But perhaps better data can be collected to permit a return to this question.

In a nutshell, the problems with the labor data we collected are threefold. First, we do not know whether coresidents with the farm operator worked on the farm or not. The Population Census recorded the occupations of these people, so we might infer that family members recorded as farm laborers worked on the family farm, but these individuals might also have worked for wages on other farms. And family members who worked on the farm might have lived in a different house than the farm operator. It is also suspected that some family members who

[34] See Jon Moen's use of our 1880 sample to estimate the productivity of southern agriculture in 1880 (Moen, 1991). His account of the difficulties in making his estimates is a good introduction to the problems of using microlevel census data for production function estimation.

worked on the farm were not recorded as farm laborers by the census. Second, given our sample we have no way of measuring how much labor each family member actually supplied to the farming effort. Third, we judge our original attempt to measure the amount of hired labor unsatisfactory for use in estimating a production function.

We suggest that with some additional work these problems can be at least partially overcome. First, while it is true that we cannot know for any given farm selected from the 1880 sample which family members worked on the farm and which worked off the farm, it is also true that we can learn something about the probabilities involved. In 1880 workers lived near their jobs; thus we can use the manuscript census of population (with its occupational information) to estimate the size, occupational distribution, and demographic characteristics of the nonfarm labor force in the vicinity of any given farm. With that information we can assign a probability to each family member that he or she was an on-own-farm worker based on the individual's sex, age, and distance from alternative occupational locations and the apparent labor surplus living on the farmstead. These probabilistic participation rates would add noise, of course, to the statistical model if the comparison is with a data set where this information was known with precision, but it would be less noisy compared to the original 1880 sample. Second, we should be able to make some estimates of the different contributions of men, women, and children to agricultural output by entering the sex and age of each family member into a production regression. Lee Craig used this approach with some success for antebellum Northern farms (1993). Unfortunately, the Southern Economic History Project, lacking foresight on this particular detail, did not collect the data on the age and sex of the family members of the farm owner. Yet that data is in the census and could be recovered since we did record the precise page and line number in the manuscripts of the population census where we located the farm owner. Third, the Agricultural Census attempted to collect the total amount of labor hired for wages in weeks and in dollars paid. It proved very difficult to collect reliable numbers in the South, and the Census Office decided not to publish tabulations. For several calculations reported in 1KF we used this raw, unpublished data to impute the amount of hired labor (p. 294). However, we suspect that there were farms, perhaps many farms, in the sample that hired some nonfamily labor (or paid family members) but did not report the wage bill. Could such farms be identified so that they could be either eliminated from the statistical calculations or so that an imputation of their hired labor input could be made? We suggest that substantial progress is possible.

There are other topics that deserve more attention. *One Kind of Freedom* gave very little attention to the situation of the white operators of small farms. But the evidence of the sample clearly indicates that these "poor whites" were in many regards caught up in the same exploitive and immiserating system as the poor blacks. They deserve a fuller treatment than we were able to provide. The collective experience of the white southern yeoman is historically important and interesting on its own, and a better understanding of this group would illuminate

and contextualize the experience of the freedmen as well. The data is in the expanded sample, which is well suited to such a study with its samples of the general farming regions.

The IPUMS adds a rich new source of microlevel data that could be used to revisit and extend a long list of topics. Occupational distributions can be traced from 1860 to 1900 and beyond. Merchant storekeepers can be identified. Education and literacy can be examined. For 1880 there is data in the public use samples on health. For 1870 and 1880 there is data that would allow a study of family and household structure. For 1870 there is data on property ownership (1KF, pp. 78–80, 298).

In a semantic game of "half-empty or half-full" scholars have debated whether black economic progress between emancipation and the Great Migration to the North was "painfully slow" or "remarkable given the initial conditions." We pushed the welfare implications of emancipation and the one kind of freedom established in the South following the Civil War somewhat further than in our book in a paper on "Growth and Welfare in the American South" (Ransom and Sutch, 1981). Much more could be learned today using the IPUMS collection to study the Great Migration, the spread of black literacy, and the black assent up the occupational distribution. Census survival techniques can be used with the IPUMS to measure the movements of a fixed cohort from one occupational status to another (Carter and Sutch, 1996).

Retrospective reflection is always good. It can energize and redirect us. But reflection and reconsideration can only be a beginning. We need to get on with the real work. There is much of it to do, and it is important.

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