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THE NORTH-SOUTH WAGE GAP, BEFORE AND AFTER THE CIVIL WAR

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ABSTRACT

In an economy with "national" factor markets, the factor price effects of a permanent, regional specific shock register everywhere, perhaps with a brief lag. The United States in the nineteenth century does not appear to have been such an economy. Using data for a variety of occupations, I document that the Civil War occasioned a dramatic divergence in the regional structure of wages -- in particular, wages in the South Atlantic and South Central states relative to the North fell sharply after the War. The divergence was immediate, being apparent as early as 1866. It was persistent: for none of the occupations examined did the regional wage structure return to its ante-bellum configuration by century's end. The divergence cannot be explained by the changing racial composition of the Southern wage labor force after the War, but does appear consistent with a sharp drop in labor productivity in Southern agriculture. I also use previously neglected data to argue that the South probably experienced a decline in the relative price of non-traded goods after the War.

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1. Introduction

In the several decades preceding the Civil War the Southern economy grew at about the same rate as the rest of the United States. On the eve of the Civil War, average living standards for free white Southerners do not appear to have been vastly inferior to their northern counterparts (Engerman 1966).[1] In the immediate aftermath of the Civil War, per capita incomes fell sharply in the South, absolutely and relative to per capita incomes in the North (Engerman 1971, Goldin 1979). The post-bellum decline in relative incomes was persistent. Southern per capita incomes did not converge noticeably on the rest of the country for the remainder of the nineteenth century – indeed, until well into the twentieth century (Wright 1986; Margo 1995).

The post-bellum decline in Southern per capita incomes has been attributed to the effects of emancipation on labor productivity in Southern agriculture.[2] According to Fogel and Engerman (1974, 1977), slavery conferred a productivity advantage in certain agricultural crops, primarily through the use of the gang system. Because the gang system – like its free labor counterpart in manufacturing – relied on extensive division of labor and labor "speed-up" to produce efficiency gains, its use was predicated on a certain minimum efficient scale in terms of numbers of slaves and, therefore, in terms of farm size. Free farm labor, however, was apparently unwilling to work under the gang system at a wage premium that would still have

[1]Margo (2000, p. 172, note 11), for example, shows that real wages of unskilled labor in the South in the 1850s were about 8 percent below the level prevailing in the North.

[2]This is not the only explanation; for example, Ransom and Sutch (1977) argue that the decline partly reflects unusually high levels of Southern incomes in 1860, as well as reductions in labor force participation among former slaves.

made use of the system profitable. With the end of the War and of slavery came the abandonment of the gang system, a loss of economies of scale, a once-and-for-all decline in the level of labor productivity in Southern agriculture (Fogel and Engerman 1974; Moen 1992; Irwin 1994).

This paper, too, assesses the economic impact of emancipation on the Southern economy but in a way that has received limited attention previously from economic historians. Specifically, I examine the evolution of nominal wages in the South, absolutely and relative to the North, before and after the War. My analysis is based on wage evidence culled from various published and archival sources, reaching back into the ante-bellum period as early as 1820s and extending (in some cases) to the end of the century.

My principal finding is that the South experienced a broad-based decline in nominal wages relative to North after the War – that is, wages diverged between the South and the North. The post-bellum divergence was immediate, being apparent as early as 1866. Based on the evidence examined here, it appears to have been broad-based, occurring for skilled and unskilled labor, men and women. It was persistent: at no point did wages in the South return to pre-war levels relative to the North during the remainder of the nineteenth century. These findings are not novel per se, but they are documented more extensively than in previous work.[3]

One explanation of my findings is that the composition of the Southern (wage) labor

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[3]Wright (1986, p. 76) provides a brief discussion of the wages of farm labor in the South before and after the War, drawing on Lebergott's (1964). Based on an analysis of data for four states (Arkansas, Mississippi, George, and South Carolina), Wright argues that "it is far from clear that the slave South was a low-wage area". However, the "relative farm wage in all parts of the South declined sharply over the Civil War decade" and Wright claims that the same was true more generally, referring readers to the "admittedly imperfect and often fragmentary wage data" in Newman (1984).

2

force changed after the War in ways that reduced average wages in the South relative to the North. With slavery abolished, the vast majority of African-Americans were now part of the free labor force in the South, and many worked, at least part of the time, for wages. If former slaves were paid less than their white counterparts, either because of differences in skills or because of racial discrimination, and if (as was the case) most former slaves remained in the South after the War, a widening in the North-South wage gap would have occurred, even if there were no other wage effects of the War. I present some evidence on this issue in Section 3, concluding that, while racial wage differences existed, the magnitudes do not appear to have been large enough to account for much of post-bellum divergence in wages, at least for unskilled labor.

Absent a compositional story, the simplest explanation of my findings is Fogel and Engerman's – that is, a negative productivity shock to Southern agriculture. Assuming that local (or regional) labor markets in nineteenth century America were unable to adjust immediately to large, geographic-specific shocks, and allowing for plausible spillover effects on the non-farm sector, a productivity shock of the magnitude claimed for the loss of the gang system, plus any others associated with the war that reduced labor productivity in agriculture, should register as a broad-based decline in wages in the South relative to the rest of the country, at least for some period of time. The logic that produces this result is straightforward: an inward shift in the production possibilities frontier in the context of a region-specific supply of labor was less than perfectly elastic in the temporal vicinity of the shock.[4]

To buttress the evidence that a productivity shock occurred, Section 4 assembles data on

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[4]See Margo (2000, ch. 6) for other evidence consistent with this view of nineteenth century labor markets.

agricultural prices and uses these, in conjunction with the data on farm wages, to construct time series of the "real product wage" in southern agriculture – wages divided by the price of output. The real product wage is the dual of the direct measure of labor productivity (output per worker). Although uses of the dual are now commonplace in economic history, measuring productivity change in Southern agriculture in such a manner does rest on assumptions that, for some readers, may be overly strong. However, the use of the dual in this context is not novel *per se*, having been made already by Moen (1992). My calculations go beyond Moen's by refining the numerator of the productivity index (the nominal wage) and by including additional years. The basic findings, however, are the same. As measured by the dual, labor productivity declined in Southern agriculture after the War, and the decline appears to have been of the "once-and-for-all" variety.

Explaining why southern wages diverged in the immediate aftermath of the War is only one half of the problem. The other half is explaining the persistence of the divergence. This is one of the deepest questions of American history, and I do not pretend to answer it completely here. My goal is more modest: I offer some new evidence on an explanation that scholars have previously thought discredited – namely, that the cost of living in the South, relative to the North, was lower after the War than before. The same sources that provide evidence on wages also provide evidence on the cost of "board" – that is, food – and this evidence does suggest that the South may have experienced a decline in the relative price of non-traded goods after the War. Such a decline could help partly explain why labor chose to remain in the South after the War for some time, despite an apparently very large gap in nominal wages.

2. Wage Levels and Regional Wage Gaps

I assemble here a variety of data on nominal wages in the South and North before and after the Civil War. The data come from various published and archival sources. While the sources I use do not exhaust all relevant ones (see, for example, Coehlo and Shepherd 1976), I believe my selection is broadly representative and, in any case, more comprehensive than those examined in previous work (for example, Wright 1986). Some of the wage estimates are seasoned in that they have been available for some time and thus subject to professional scrutiny. Others are tentative – in one case, entirely novel – and may change with further work. In cases where the underlying data refer to a labor contract in which board was customarily paid along with a money wage – for example, farm labor paid a monthly stipend plus board – I use ancillary information to impute a dollar value to board. The occupations are reasonably wide-ranging – farm labor, unskilled non-farm (or "common") labor, carpenters, and female domestics.

In terms of frequency of observation and underlying geographic detail, the data are of two types – state-level "panel" data pertaining to census or other years, and annual regional time series. These are presented and analyzed separately, although the analyses are similar. I present "level" estimates separately for the South Atlantic and South Central regions, and for the North, where "North" refers to a weighted average of estimates for the New England, Mid-Atlantic, and North Central states. The figures for the two southern regions are also expressed as ratios, relative to the North. I use the underlying data in a regression context to estimate "treatment effects" of the Civil War, again separately for the South Atlantic and South Central states. These effects can be thought of as the post-1865 change in the coefficients of regional dummy variables

– the South Atlantic and South Central – relative to the pre-war average in a log wage regression, when the "left-out" regional dummy is the North.

Before turning to the data and results, a few caveats. Other than occupation, nineteenth century sources of wage evidence usually contain little or no information about the human capital characteristics of wage labor.[5] Thus, for example, if one observes differences in the original data in the daily wages of common labor between, say, Iowa and Massachusetts, in 1860 – which ones does – this could be because a true geographic difference existed, or it could be because common labor in Iowa differed from common labor in Massachusetts in ways that would affect wages in either location.[6] Or it could be that wage labor was compensated "in-kind" in various ways in one location but not another, and this was not recorded in the survey, but was known (and acted on) by individuals at the time. In many of the sources wages were often quoted as being the "average" in a locality, but exactly how the average was determined, or to whom it pertained, is rarely described in the sort of detail customary in twentieth century sources. These data deficiencies are such that one would not want to place much interpretive weight on small movements, up or down, in wage levels or regional gaps.

State-level Panel Data

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[5]In the data examined here, gender is revealed in the occupational title (female domestics) or in the underlying micro-data. Race, as well, may be inferred for some data (see section x).

[6]Later in the paper I consider whether the change in the racial composition of the free labor force in the South produced by emancipation might explain the post-bellum decline in Southern wage relatives.

The state-level panel data derive primarily from four sources: (1) the 1850 and 1860 published tables of the Census of Social Statistics, and extant manuscript records for selected states of the 1870 Census of Social Statistics (2) surveys conducted for various years by the Department of Agriculture (3) nationally representative samples of establishments from the manuscripts of the 1880 Census of Manufactures (see Atack and Bateman 1999) (4) estimates prepared by Lebergott (1964) from some of the same sources, as well as others. The unit of observation is the state, and each figure could be thought of (in principle) as a state "average" of equally weighted observations within each state.[7] Sources #1 and #2 provide information on farm wages; sources #1, #2, and #4, on common non-farm labor and artisans; and sources #1 and #4 on female domestics.

The basic estimates are presented in Table 1. The notes to the table describe the various sources and methods of construction in greater detail. All regional aggregates are weighted averages of the state-level figures, with the weights pertaining to the free adult (16+) male or female (16+) labor force, as estimated by Weiss (1992, 1999). This weighting scheme is (largely) arbitrary and (certainly) debatable. Experimentation with other weights suggests that the substantive results reported below are essentially independent of the weighting scheme. The reader should bear in mind that certain estimates derive from underlying data that are less than fully comprehensive, in that not all states are represented.[8]

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[7]In some cases, notably the social statistics data, the underlying data within states – again, in theory – pertain to averages for known geographic areas (minor civil divisions). The census of manufacturing data are state-level averages of establishment level data, in which each establishment is weighted by total employment.

[8]In particular, this is true for 1870. All estimates for 1870 derive from the extant manuscripts of the 1870 Census of Social Statistics, the collection of which is on-going.

Panels A and B show estimates for farm labor and common non-farm labor. Because of the nature of the underlying data far more temporal detail is available for farm wages than for common wages; however, both in terms of levels as well as changes the two types of wages are in close agreement.

In 1850 wages of farm and common labor were lower in the South than in the North, especially in the South Atlantic states. Nominal wages rose in the South in the 1850s at a faster pace in the North, such that much of the wage deficit experienced by South Atlantic labor relative to the North in 1850 disappeared, while wages in the South Central region were slightly higher on the eve of the Civil War than in the North.

Between 1860 and 1866 farm wages increased by nearly 50 percent in the North, while remained essentially fixed in the South Atlantic states and declining slightly in the South Central states. Consequently, in the immediate aftermath of the Civil War, Southern wage relatives – the ratio of wages in the South Atlantic or South Central regions relative to the North – declined dramatically.

The Southern economy was in a highly chaotic state in 1866, and one might presume that the immediate effects of the War on wages were simply that – immediate, not lasting. However, after 1866 the trends in unskilled wages appear to have been broadly similar across regions. Wages remained at their immediate post-war (nominal) peak until at least 1870, but then fell afterwards, bottoming out in the late 1870s. Wages rose through the 1880s but fell again in the early 1890s, recovering somewhat late in the decade. These patterns generally fit the known contours of the post-bellum business cycle – the 1890s decline, in particular, being associated with (close to) depression conditions. Importantly, for neither farm nor common labor, is there

evidence of any substantial "mean reversion" in Southern wage relatives – the immediate post-bellum declines in the South's position relative to the North remained more or less in place for the remainder of the century.

Panel C shows estimates for one type of skilled labor, carpenters. In contrast to common and farm labor, wages of carpenters in the South Atlantic states in 1850 were virtually identical, on average, to wages of carpenters in the North, whiles wages in the South Central region were 22 percent higher. As was true for common and farm labor, carpenter's wages in the South rose faster than in the North in the 1850s, making southern wages relatives even more favorable on the eve of the Civil War. Elsewhere, I have shown that similar regional contrasts before the Civil War existed for white collar labor (see Margo 2000, Table 3A.7). That is, prior to the Civil War, it appears that the returns to skill were higher in the South than in the North.[9]

Between 1860 and 1870 nominal wages of carpenters increased in the South, to a much greater degree than for common or farm labor – that is, the skill differential in the South in 1870 was higher than in 1860. In the North, wages rose to an even greater extent in the 1860s and, just as was the case for farm and common labor, wages of carpenters in the South declined relative to the North between 1860 and 1870. Nominal wages fell in both regions in the 1870s, to a lesser extent in the South than in the North, but not enough to return the South to its pre-war position relative to the North.

Estimates of weekly wages of domestics with the value of board imputed are shown in

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[9]This difference in returns to skill implies that the ratio of skilled to unskilled wages differed between the South and the North prior to the Civil War. This could be taken as *prima facie* evidence of regionally "balkanized" labor markets – that is, the absence of national markets for labor of all types – although it is not conclusive evidence of balkanization.

Panel D. As was true in the other occupations, wages in the South rose relative to the North during the 1850s, but then declined sharply relative to the North in the 1860s. The next available data on domestics pertains to the very end of the century, and it indicates an even further erosion of the South's relative position in the national wage hierarchy.

The last two rows in each of the panels give equally weighted averages – labeled "grand means" - of pre- and post-war ratios of Southern to Northern wages. Computing the ratio of the pre- and post-war grand means of these ratios gives a (crude) estimate of the "treatment effect" of the Civil War on the North-South wage gap.[10] According to this method, the effect of the War was to reduce wages of farm labor in the South Atlantic relative to the North by 23.1 percent [= (0.60/0.78) - 1].

A (slightly) more refined way to estimate treatment effects is the regression:

$$\ln w_{it} = \alpha_i + \tau_t + \beta_{SA} D_{SA} + \beta_{SC} D_{SC} + \epsilon_{it}$$

where the α's are state fixed effects (i indexes the state); the τ's are year dummies (t indexes the year); ϵ is the error term; D_{SA} is a dummy variable taking the value one if an observation pertains to a South Atlantic state after 1865, zero otherwise; and D_{SC} is a dummy variable taking the value one if an observation pertains to a South Central state after 1865, zero otherwise.

In this regression set-up the β coefficients measure the treatment effects of the War and, in log terms, are analogous to the "pre-post" ratios of grand means discussed immediately above.

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[10]I use the term "treatment effect" in a (very) loose sense. In particular, I am not controlling explicitly for post-Civil regional shocks that could have compounded (or mitigated) the effects of the War.

As in the computation of the regional figures in Table 1, observations are weighted by state-level estimates of the free adult male or female (in the case of domestics) labor force prior to estimation.

The treatment effects (the ('s) are shown in Panel E of Table 1. Several features are apparent. First, the treatment effects are larger if the samples are restricted to the census years 1850-70 than if 1880 is included; or, in the case of farm labor, if all years are included. That is, the "short-run" treatment effects appear to have been larger than the "long-run" effects. [11] Second, adding 1900 (or 1899) to the 1850-80 census year samples results in larger treatment effects, which probably has less to do with the War *per se* than the impact of agricultural depression in the 1890s. Third, any regional difference within the South in the size of the treatment effects appears to have been small. Fourth, among the different types of unskilled labor (farm, common, and female domestics) differences in the size of the treatment effects appear to have been small.[12] However, the treatment effects on skilled wages (carpenters) appear to have been smaller than for unskilled labor, implying that the skill differential (the ratio of skilled-to-unskilled wages) in the South rose relative to the skill differential in the North after the Civil War.

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[11]Averaging the South Atlantic and South Central treatment effects using the 1850-80 census year sample for common labor and farm labor (four estimates) gives a log impact of -0.328, which corresponds to a 28 percent decline in the aggregate South/North wage ratio. Averaging the South Atlantic and South Central treatment effects using the full (1850-1899, all years) sample for farm labor also gives a log impact of -0.328.

[12]The short run (that is, as of 1870) treatment effect on domestics may have been slightly smaller than for other unskilled labor, which may reflect a decline in female labor force participation among ex-slaves (alleged by Ransom and Sutch 1977). However, the standard errors around the treatment effects are such that one cannot reject the hypothesis that the effects were the same for all types of unskilled labor.

<u>Regional Time Series</u>

Elsewhere I have estimated annual series of nominal wages of common labor, artisans,

and white collar workers, by census region (Northeast, Midwest, South Atlantic, and South

Central) for the period 1820 to 1860 (Margo 2000). The data derive from payroll records of

civilian workers of the United States Army who were employed at various forts and other

military installations throughout the country. Comparisons with purely civilian sources suggest

that, by and large, the Army paid the going wage in the local labor market surrounding the fort.

The ante-bellum series are derived from hedonic regressions controlling for various worker

characteristics reported in the payrolls, and (in the case of common labor and artisans) are

benchmarked to 1850, based on the Census of Social Statistics, also used in Table 1.

Similar payroll records are also available for the post-bellum period. I am currently

engaged in a project to collect regional samples of these with the aim of producing post-bellum

series similar to my ante-bellum series. Currently the available post-bellum samples cover the

period 1866 to 1880; and, using these, I have produced annual series for common labor by census

region. Like the ante-bellum series, these also derive from hedonic regressions, but the post-

bellum series are much more frequently benchmarked than are the ante-bellum series. Because

of the more frequent bench-marking, I believe these series to be accurate representations of

underlying wage movements on an annual basis – indeed, possibly more accurate than their ante-

bellum counterparts -- but, because they are preliminary estimates, they should be viewed with

considerable caution. The details of construction as well as the annual estimates by region are

shown in Appendix Table 1.

An important advantage of the regional series is that they extend further back in time than the state-level panel data. Panel A of Table 2 shows five-year averages of daily wages of common labor for the South Atlantic and South Central states, and for the North, from 1821 to 1860, as well as South-North wage ratios. In the 1820s daily wages of common labor in the South Atlantic states were about 10 percent lower than on average than in the North, while wages in the South Central states exceeded Northern levels at the same time.

In the early 1830s wages in the South began to lag behind wages in the North. They recovered somewhat by the late 1830s, fell back again during the economic downturn of the early 1840s in the South Atlantic region and in the South Central states in the late 1840s, before experiencing some mean reversion in the 1850s, thereby confirming the findings of Table 1. Computing the grand means of the ante-bellum South-North wage ratios (the final row of Panel A of Table 2), wages in the South Atlantic averaged about 83 percent of the level in the North over the 1821-1860 period, while wages in the South Central region were slightly higher (about 4 percent) than in the North. That is, the regional series suggest that, relative to the North, the South Atlantic states were already a "low-wage" (Wright 1986) region prior to the Civil War, but this was not so for the South Central states (Margo 2000).

Panel B shows five-year averages for the period 1866-1880. In every region nominal wages were falling over this period. However, at the start of the post-bellum period, just after the Civil War, the level of nominal wages in the North far exceeded the level in the South Atlantic or South Central states; and these regional gaps remained large to the end of the post-bellum sample period (the late 1870s).

13

As with the state level panel data it is possible to use the ratio or regression method to estimate the treatment effects of the War. The regression estimates of the treatment are shown in the last row of Table 3, and are virtually identical: -0.44, in logs, or about a 35 percent decline – for both the South Atlantic and South Central regions. For the South Atlantic states the estimate using the regional series is quite similar to the estimates using census year state-level data for 1850-80 (common labor) but the regional estimate is slightly larger than the analogous state-level estimate for the South Central states – an indication that, for much of the ante-bellum period, the common wage in the South Central states relative to the North was higher than the average level that prevailed in 1850.

In sum, state-level panel data for census years and annual region time series suggests that the Civil War was associated with a dramatic divergence in the regional structure of wages in the nineteenth century United States.[13] In particular, the North-South component of the regional structure diverged markedly in favor of the North. The degree of divergence varied across occupations – in particular, there appears to have been more divergence for unskilled labor, resulting in a rise in the skill differential in the South relative to the North.

3. Explaining the Post-Bellum Decline in South/North Wage Ratios: The Role of Compositional Change

Wage data from a variety of sources and occupations point to a sharp decline in the

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[13]A similar divergence occurred for interest rates and, probably, for land prices; on interest rate divergence see Bodenhorn and Rockoff (1992).

South's position relative to the North after the Civil War. While the "low-wage" South did not

owe its origins solely to the War, a structural break – divergence -- did occur with emancipation.

What caused this structural break? In the Introduction I alluded to the story favored by

Fogel and Engerman – a decline in agricultural productivity in the South occasioned by the loss

of the gang system, among other disruptions produced by the War. Fogel and Engerman's

explanation places the onus on the labor demand side. However, there is a supply-side

explanation: a shift in the composition of the Southern wage labor force after the end of the War

such that wages in the South fell relative to the North.

Although there are many ways such a compositional change might have manifested, the

most likely involves racial change. Before the Civil War the vast majority African-Americans in

the South were enslaved, and few were employed as wage laborers.   When slavery ended, all

labor in the South was, by definition, free labor, and some ex-slaves chose to enter the wage

labor market. If former slaves were paid less than their white counterparts, whether because of

differences in human capital or because of discrimination, some of the post-bellum regional

divergence in wages might be explained by an increased proportion of African-Americans in the

Southern wage labor force.

How large could this compositional effect be? To answer this question, the following

identity is useful

$$W_{sj} = W_{swj} \times (1 - \$_{sj}) + W_{sbj} \times \$_{sj}$$

where W = average wage, j indexes the occupation, s = South, w = white, b = black, and $ =

15

percent black. Letting W_{nj} be the average wage in occupation j in the North (n), the identity can

be re-expressed in ratio form as

$$W_{sj}/W_{nj} = N_j \times [1 + (r_{sj} - 1)\$_{sj}]$$

where $N = W_{sw}/W_n$ and $r_s = W_{sb}/W_{sw}$. Treating N and r as constants, it follows that

$$) (W_{sj}/W_{nj}) = N_j \times (r_{sj} - 1) \times) \$_{sj}$$

The left-hand-side of this expression is the compositional effect. The magnitude of the effect

depends on (1) N, the ratio of the wage of white labor in the South to the Northern average wage

(2) r, the extent of racial differences in wages in the South (3)) $, the change in the African-

American share in occupation j associated with emancipation.

It is important, if obvious, to note that, if r >=1, the compositional story is irrelevant, no

matter what the values of N or) $. Also, because some ante-bellum free blacks, as well as

slaves, worked for wages, and not all post-bellum Southern workers were black, it follows that

) $ <1. For common and farm labor the evidence presented in Tables 1 and 2 suggests that $N <$

1 in the South Atlantic states before the Civil War, and slightly greater than one in the South

Central states, as a first approximation. Assuming, as a point of departure for the calculation,

that the true value of N did not change after the War. The explanatory power of the

compositional story hinges on whether r was close to zero (a large racial wage gap) or close to

one (a small racial wage gap).

Race-specific data on farm wages were collected by the U.S. Department of Agriculture at the very end of the nineteenth century. The USDA data were published in the form of state averages. In addition, the sample of farms from the 1880 Census of Agriculture collected by Roger Ransom and Richard Sutch (1977) contains sufficient information to estimate a value for r, although the nature of the 1880 data is such that the estimate for 1880 should be viewed with considerable caution.[14]

Table 4 shows estimated values of r from the Ransom and Sutch sample and for the late nineteenth century USDA sample. Estimates are shown separately for the South Atlantic and South Central regions. It is immediately obvious that, regardless of the source of the data, r was less than one but relatively close to it; on average, the racial wage gap appears to have been relatively small. This, of course, is not a new finding. Higgs (1972, 1975; see also Wright 1986) reached a similar conclusion based, in part, on the same data. There is some indication of a decline in r between 1880 and the end of the century which, if true, could contributed to a continued stagnation in the North-South wage gap. However, any such decline appears to have been small and, in view of the assumptions underlying the 1880 calculation, may very well be in

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[14]The 1880 Census of Agriculture reported the number of weeks of hired labor separately for black and white workers along with the total wage bill, that latter not separately by race. The average weekly wage is estimated as the total wage bill divided by the total number of weeks of hired labor. Before estimating the overall average across farms, I "trimmed" the data (excluded observations) of farms for which the farm-level average was deemed to be too low or too high (see the notes to Table 4). In Table 4, the weekly wage of white (black) labor pertains to farms that hired only white (black) labor. This yields a biased estimate of either the white or black wage because it excludes farms that hired both white and black workers. For these farms the data do not speak directly to racial wage differentials. Higgs' (1977a, p. 243) analysis of manufacturing data from the early 20th century Virginia, which do reveal racial wage differentials within integrated establishments, suggests that excluding integrated farms from the 1880 calculation may bias my estimate of r downwards.

the range of sampling (and other) error.

Even with r in the neighborhood of 0.91 (the USDA data) and assuming that $N = 1$, the compositional effect must have been less than ten percentage points (because) $ < 1). Even at ten percentage points, the compositional effect could only explain a third of the post-bellum divergence in the North-South gap in farm wages. In fact, this is a serious over-estimate of the upper bound. The USDA data also suffice to estimate the value of N and, as also shown in Table 3, $N < 1$. Put another way, white farm labor in the South earned far less than farm labor in the North, which was overwhelmingly white, after the War. However, as shown in Table 1, this was not the case prior to the Civil War.

In sum, it does not appear that the changed racial composition of the Southern wage labor force after the Civil War can account for the divergence of the North-South wage gap, certainly not in the case of farm labor. Moreover, what was true for farm labor is very likely to have been true for common labor, because unskilled labor flowed freely (within the South) between the farm and non-farm sectors (see Wright 1986). For skilled labor, there is less information available; what there is suggests that racial differences in skilled wages – again, in the South – were larger than racial differences in unskilled wages (see Higgs 1977). However, because relatively few slaves received training in skills before the Civil War and because there were racial barriers to entering the skill trades after the War, the change in racial composition was far smaller than for unskilled labor.   These results do not completely preclude a compositional story, but they do suggest that the explanatory power of any such story is arguably small.

4.0 Labor Productivity in Southern Agriculture: A Dual Approach

By definition, labor productivity is output divided by the labor input. An alternative to the direct measure is the dual: wages divided by the price of output, or w/p. The basic idea of the dual is that, if labor is paid the value of its marginal product, then (1) w/p is a first order approximation to output per worker (2) the growth rate of w/p – or equivalently, an index of w/p – tracks the growth rate of output per worker, again to a first order of approximation.

The dual has been used the economic historians to measure changes in agricultural labor productivity in various settings, either because direct data on outputs and inputs are not available, or as a check on the plausibility of assumptions underlying a direct calculation (see, for example, David 1967; Rothenberg 1992). To the best of my knowledge, there has been one previous use of the dual to track labor productivity in Southern agriculture before and after the Civil War. This calculation was made by Moen (1992), purely as a check on the robustness of his direct measures of output per worker computed from the 1860 and 1880 censuses of agriculture.

Moen's calculation was (very) briefly described in a footnote.[15] Essentially, what he did was (1) compute the 1880/1860 ratio of monthly farm wages in the South and (2) divide the ratio of farm wages by the 1880/1860 ratio of agricultural prices in the South. Using the Parker-Gallman sample, Moen valued outputs at the farm level at 1860 prices, and again at 1880 prices; his price index is simply the 1880-to-1860 ratio of average values of farm outputs. Output-specific prices are from Towne and Rasmussen (1960) and are national averages. One could – and Moen did – follow the same procedure in reverse using the Ransom-Sutch sample of farms from the 1880 Census of Agriculture. The results were the same – on average, Southern

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[15]My description of this calculation is based on personal communication with it's author, for which I thank Jon Moen.

agricultural prices were about 5 percent higher in 1880 than in 1860.

To compute the numerator of the dual, Moen relied on the state-level estimates of farm wages as reported in Lebergott (1964). Lebergott's figures pertain to the portion of the monthly farm wage paid in money terms; they do not impute a value to board, even though the underlying data clearly pertain to labor contracts in which board was provided (and hence, such an imputation is clearly desirable). The overall Southern wage was computed by weighting each state's wage by its share of the agricultural labor force. Dividing the 1880/1860 wage ratio by the 1880/1860 price ratio, Moen concluded that labor productivity in Southern agriculture declined by about a third between 1860 and 1880.

My calculation of the dual builds on Moen's by (1) imputing a value to board in computing the wage index (2) adding census years, specifically, 1850, 1870, 1890, and 1900. Adding years requires a different approach to computing the price index, because there are no equivalent sample farm data for census years other than 1860 and 1880. To compute the price index, I first derived a set of output weights $^{\star}_i$ for a set of outputs produced in Southern agriculture in 1860 (i indexes the product). These weights can be thought of as each product's share of the total net value of agricultural production, where "net" refers to allowances for seed, livestock feed, and so on.[16] Outputs of various crops and livestock were as reported in the published volume of the 1860 Census of Agriculture. As in Moen's calculation, prices were taken from Towne and Rasmussen. Let p_{it} be the price of the ith output in year t, after normalizing each p_i in 1860 to be one. The overall price index, P_t, is a geometric-weighted

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[16]By net I refer to deductions for allowances for seed, consumption of corn by animals, and so on; for this purpose I relied on Yang (1992), and Fogel and Engerman (1974).

average of the commodity-specific indices

$$\ln P_t = E \ {}^*{}_i \ln p_{it}$$

Note that, by definition, $P_{1860} = 1$.

The dual is the ratio of the wage and price indices. The wage indices (South Atlantic and South Central) are derived from the census year values for farm labor reported in Table 1. For the purposes of this paper, I assume that the same price index prevailed in both the southern regions.[17] For ease of interpretation, I multiply all values of the dual by 100; thus, in particular, the 1860 value is 100. The price index and the dual indices are shown in Table 5. The notes to the table list the goods included in the index and their weights. Note that, according to my calculations, agricultural prices in the South in 1880 were 6.8 percent higher on average than in 1860, very similar to Moen's estimate (5 percent). Also shown in Table 5 for comparison purposes is an index of real per capita income for the entire South, from Goldin (1979).

My results strongly reinforce Moen's. Accepting the validity of the dual at face value, a substantial productivity shock did indeed hit Southern agriculture between 1860 and 1870. Productivity recovered in the 1870s, but in 1879 was still well below the level recorded in 1860. A simple average of the index numbers for the two southern regions in 1880 implies a productivity decline of 31 percent. This is just shy of what Moen's dual estimates imply (33 percent, see Moen 1992, ftn. 21, p. 348) but less than what is implied by his direct estimates

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[17]It would clearly be useful to construct a regional price index to deflate wages. It would also be useful to experiment with weights from different years, or allow for shifts in weights. Both are extensions left for future work.

based on outputs and inputs from the 1860 and 1880 censuses, unless a substantial allowance is made for a reduction in labor force participation by former slaves.[18]

Based on the dual productivity appears to have recovered substantially in the 1880s before falling again in the 1890s – a period of agricultural depression. Cumulating the ups and downs, labor productivity in Southern agriculture at century's end was below the level prevailing on the eve of the Civil War.   Note as well that, with one exception -- the 1890s -- changes in real per capita income between the years shown in the table were the same sign and – except in the 1880s – similar in magnitude to the changes in agricultural labor productivity.[19]

Thus, my index suggests that the level of labor productivity in Southern agriculture fell "once and for all" after the Civil War. After the level effect had settled in, productivity began to grow again, as did per capita income. Nevertheless, the level of labor productivity in Southern agriculture at century's end was lower than the level prevailing on the eve of the Civil War, particularly in the South Central states.

One can question my calculation of the dual in the small and in the large. In the small, there is a point raised by Moen (1992).   The numerator of the dual pertains to adult male labor, and wages of other types of farm labor might not have moved proportionately with it. However,

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[18]See Moen (1992, p. 332). In particular, allowing for 30 percent reduction in the labor input of former slaves yields a decline of 33 percent in labor productivity in Southern agriculture between 1860 and 1880.

[19]The exceptions all revolve around the estimates of w/p for 1890. The numerator of the index for this year is a simple average of the estimates for 1888 and 1890, but the substantive findings would not change if I simply substituted either year's figure for the average. The major reason why the dual increases in the 1880s is that prices fell sharply (see Table 5). I have no reason to doubt Towne and Rasmussen prices, however, for either 1880 or 1890, so the resolution of the conflict between the changes in the dual and per capita income in the 1880s and 1890s must await further research.

as argued earlier, the treatment effects of the War on southern wages seem to have approximately

the same for all types of unskilled labor, which suggests that Moen's point may have minor

empirical relevance.

A more trenchant criticism is to ask under what conditions the dual would provide a

reliable way to measure productivity change in an economy switching from slavery to freedom,

an issue that Moen did not join. As a (theoretical) point of departure for answering this question,

imagine that the Southern economy produced two goods, C(otton) and X (a composite

commodity). Initially, there are two types of labor, slave (S) and free (F). Cotton can produced

under two technologies, one using slave labor

$$C^S (L_{SC}, T_{SC})$$

and the other using free labor

$$C^F (L_{FC}, T_{FC})$$

The composite commodity has a single technology, in which slave and free labor are assumed to

be perfect substitutes

$$X(L_{FX} + L_{SX}, K)$$

where T is a factor specific to the production of C – "land" – and K is specific to the production

of X. Although T is not used in the production of X, owners of T are free to allocate to use with

slave or free labor in the production of C. The price of X is normalized at one.

Assuming the free labor is freely mobile between X and C and – this is the key point –

owners of slave labor allocate their chattel between the two sectors to equalize the marginal

returns, the following conditions characterize an equilibrium

$$p_C \partial C^S/\partial L_{SC} = \partial X/\partial L_{SX}$$

$$p_C \partial C^F / \partial L_{FC} = \partial X / \partial L_{FX}$$

$$\partial X / \partial L_{FX} = \partial X / \partial L_{SX}$$

provided that, in equilibrium, the solution is "interior" -- that is, L_{SX}, L_{FX}, T_{SC} and T_{FC} are all

non- zero. The gang system might make slave labor more productive than free labor in the

production of C, on average. At the margin, however, as long as some slave labor is employed in

the production of X, and slave and free labor are perfect substitutes in this sector, the marginal

returns to slave and free labor will be equalized. The availability of the gang system shifts the

allocation of slave labor towards the production of C (compared with an economy with slave

labor but no gang system) and, because it is a more productive technology, raises the aggregate

level of w/p_C. When the gang system is no longer, w/p_c declines.

Is this a reasonable argument? One the one hand, there is no question that slaves were

employed in the production of "cotton" (as above) under the gang system, but also in the

production of many other goods that did not rely on the gang system. According to Fogel and

Engerman, free labor shunned the gang system, but free labor certainly produced cotton before

the Civil War. And, again based on Fogel and Engerman, there appears to have been no special

productivity advantage to using slave labor over free labor except under the gang system. That

is, without the gang system, slave and free labor were very close, perhaps even perfect substitutes

(as the model assumes). On the other, the (little) model displayed above presumes that the

Southern economy was in long-run equilibrium before the War, at least as far as the allocation of

labor and labor was concerned. The opposite, however, could be argued; in particular, that more

slaves should have been allocated to the production of cotton and other goods that made use of

the gang system. However, if this were true, it would follow that the dual would understate the

(true) value of the marginal product of slave labor before the War and, therefore, understate the decline in labor productivity.[20]

5. The Persistence of the North-South Wage Gap: Some New Evidence

I have shown that a yawning wage gap opened up between the South and North after the Civil War. The explanation that I, and others (Fogel and Engerman, 1974; Moen 1992) have offered is that the South suffered a negative productivity shock to its agricultural sector.

If there had been a single, "national" market for each type of labor, operating with complete efficiency and instantaneous adjustment, the impact of local or regional shocks would have not registered as a broad-based decline in Southern wages relative to the rest of the country, in the short run, and *a fortiori*, not in the long run. Historically, there is no basis for supposing that local labor markets in the 19th century United States would have adjusted instantaneously, either to shocks or even known, exogenous differences in underlying productivity. When gold was discovered in California in the late 1840s, nominal and real wages soared, well above initial levels and well above levels prevailing elsewhere in the country, for several years (Margo 2000, ch. 6). Real wages of common labor and artisans were much higher in the Midwest than in the Northeast in the 1820s, a signal that labor need to move "west", but the Midwest was not settled overnight (Margo 1999). Nonetheless, there still appears to be a puzzle: why did the divergence in the North-South wage gap persist for so long after the War.

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[20]As Moen (1992, p. 348, ftn. 21) notes, most of his direct estimates of labor productivity imply a larger decline between 1860 and 1880 than his (or, for that matter, my) estimates based on the dual.

Assuming that the persistence was induced by some "permanent" factor – that is, persistence cannot be attributed to a succession of negative shocks after the War unrelated to the War itself -- different answers have been given to this question.[21] According to Gavin Wright (1986), labor markets in the Northern United States became increasingly intertwined with those in northern Europe after the Civil War. This was a common "North Atlantic" labor market that, according to Wright, South was excluded from.   I, on the other hand, have argued that migrants from the South, black and white, tended to be better educated than those that stayed behind (Margo 1990). The South was backward educationally after the War; perhaps a better-educated population would have responded more quickly, and in numbers sufficient to bridge the wage gap. A third explanation is that inefficiencies associated with sharecropping and "debt-peonage" plagued post-bellum Southern agriculture (Ransom and Sutch 1977).[22] This explanation still requires some ancillary story (either Wright's or mine) to explain why labor chose to remain in the South, since sharecropping and debt peonage do not appear to have vastly restricted the within-South mobility of agricultural labor (Wright 1986).

There is another explanation, rejected explicitly by Wright (1986, p. 67). This explanation is that the "cost of living" was lower in the South, relative to the North, after the War than before. If the relative cost of living were lower after the war, it is possible that regional divergence in the "real consumption wage"after the War was smaller than in nominal wages,

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[21]This is a strong assumption; as noted earlier in the paper, the wage evidence is consistent with the view that the South suffered disproportionately from economic downturn of the early 1890s.

[22]As noted earlier, Ransom and Sutch (1977) also emphasize a reduction in labor supply among ex-slaves (women and children).

making it easier to understand why labor might have remained in the South, at least for some time.

Wright rejected this explanation on empirical grounds, drawing his evidence from Coehlo and Shepherd's (1974) regional cost of living indices, which span the period from 1850 to 1890. According to Wright, these give no indication that the cost of living in the South was lower relative to the North after the War (or, for that matter, before). The Coehlo and Shepherd indices are based on urban data, and prices are known to have been lower in rural areas. Wright (1986, p.281) insisted, however, that a rural-urban price gap obtained in both the North and South, and thus "had no bearing" on the issue. But Wright presented no hard data to back up this claim and none, as far as I can tell, has been forthcoming from other scholars.

Many of the same sources that yielded information on wages also contain information on the cost of "board" – that is, food. Expenditures on food loomed very large in nineteenth century budgets so, while obviously not a complete measure of the cost of living, board potentially captures a significant component.

Table 6 shows estimates of the daily cost of board for the South Atlantic and South Central regions, the North, and the two southern regions relative to the North. These data clearly indicate a decline in the cost of board in the South, relative to the North, after the War: the treatment effect of the War extended to board as well as to nominal wages. Indeed, the change in the South's cost of board relative to the North was quite similar in magnitude to the change in its relative farm or common wage. If we assume that changes in the relative cost of board fully capture all changes in the relative cost of living, it appears that the South suffered <u>no</u> decline relative to the North in real consumption wages after the War.

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Is this a plausible assumption? Elsewhere I have argued, essentially on empirical grounds, that regional differences in the cost of board between the Midwest and Northeast at the beginning of the1850s very closely approximate what is implied by Coehlo and Shepherd's estimates; and, as result, one can use regional differences in the cost of board – say, ca. 1850 – are plausible "sufficient statistics" to compute benchmarks estimates of regional differences in the cost of board (see Margo 2000, p. 103). However, it is a more than a small step to use this "stylized fact" as justification for using changes in the cost of board in the South relative to the North after the War to measure changes in the South's relative cost of living.

In particular, board measures expenditure on food, and expenditure is price times quantity. What we are after is not the quantity component, but the price component. If the demand for food were Cobb-Douglas, nominal expenditure on food would be a linear function of nominal income, and it would not be surprising to discover that the South/North ratio of board moved approximately "one-for-one" with the South/North ratio of wages after the War. However, as long as the own-price and income elasticities of the demand for food in the South were less than one – which seems quite reasonable for common and farm labor, based on studies of nineteenth century household budgets (see Haines 1989), not to mention Engel's Law – the data in Table 6 imply that an important component of the cost of living – food prices – must have fallen in the South relative to the North at least somewhat after the War.[23]

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[23]Let b = board, p = price of food, q = quantity, and b = pq. Also, let $q = cp^{-\eta} w^{*}$. Letting ")" indicate the change in the North-South ratio after the War (the treatment effect), it can be shown that) ln p = [) ln b - *) ln w]/1-, . As noted in the text,) ln b was quite similar in magnitude to) ln w for common and farm labor – indeed, slightly greater – and both are negative in sign. Thus, as long as , <1 and *<1,) ln p will be negative, a decline in the price of food in the South, relative to the North, after the War.

Why might such a decline have occurred? Board – along with room – is perhaps the quintessential "non-traded" good. Board is "produced" using raw materials (food); capital equipment and, typically, a little land (not much of either); fuel; and, most importantly, labor. The evidence in Table 5 indicates the nominal wages in the South declined after the War relative to prices of agricultural goods that were traded nationally (and internationally). The data in Table 6 suggests, therefore, that the relative price of non-traded goods must have declined in the South after the War.

It is possible to flesh out the details of the model in the preceding section to illustrate an economic mechanism through which a decline in the relative price of non-traded goods might have occurred in the South after the War. Using the notation in the preceding section, let X now represent the non-traded good, C the traded agricultural good – the South's export – and assume that Southerner's consume X plus an imported good M (northern manufactures). The prices of C and M are assumed to be set in world markets, and these are also assumed – unrealistically to be sure – to be exogenous. Aggregate factor supplies (labor, capital, land) in the South are exogenous.[24]

The negative shock to the production of C reduces labor demand in the sector. This releases labor to the production of X, shifting the supply of X outward, and causing the nominal wage to decline relative to the price of C (or M).[25] At the same time, aggregate real income

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[24]This rules out migration to other regions, for example, in response to the negative shock to C production.

[25]The model as specified has one type of labor – unskilled. Suppose, instead, that production of X– but not C – requires skilled labor as well as unskilled labor. Under reasonable conditions, the wage of skilled labor will also decline but not as much as the unskilled wage – which, as noted earlier, appears to have happened in the South after the War.

declines in the South, reducing the demand for X (and, for that matter, M). A new equilibrium is

reached at which the price of X is now lower relative to either the price of C or the price of M.[26]

In one sense, it may not be very surprising to learn that the relative price of non-traded

goods fell in the South after the War.[27] There is considerable evidence today, for example, that

the relative price of non-traded goods is lower in poor than in rich countries. The South was

nothing if not poor in the aftermath of the War. However, at this stage the evidence in Table 6

should be regarded as suggestive only, a challenge to the conventional wisdom that the

persistence of the "low-wage" South after the War cannot be explained by regional differences in

the cost of living. Far more work needs to be done to determine if the apparent implications of

the data on the cost of board are borne out for other goods, as well as whether the economic

mechanism behind changes in non-traded goods prices is the right one historically.

6. Concluding Remarks

Demonstrating that output per capita declined sharply in the South after the Civil War

was one of Stanley Engerman's many enduring contributions to American economic history. The

decline in Southern per capita income was not accompanied by a similar decline outside the

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[26]Whether the non-traded goods price will fall relative to the wage is not determinate. Under realistic assumptions, however, w will decline more than the price of the non-traded good – which is probably what happened historically, again given realistic assumptions about income and own-price elasticities.

[27]It is also known that land prices in the South fell after the War (see Moen 1992), which suggests that the relative price of housing probably declined. In the case of one very major Northern city – New York – it is known that land prices increased dramatically after the war; see Atack and Margo (1998).

region – that is, at the regional level, per capita incomes diverged in the wake of the Civil War. This paper has assembled a variety of data to show that a similar regional divergence occurred in nominal wages. Absolutely, and relative to wages in the North, wages in the South declined after the Civil War. The divergence in wages was not confined to a single occupation, although it appears to have been more substantial for unskilled than for skilled labor. It was persistent, in the sense of remaining in place through the remainder of the nineteenth century.

Such a divergence could have been caused by a shift in the composition of the Southern wage labor force after the War. Such a shift did occur in racial composition, but I showed that, based on the available data, it appears unlikely that a compositional explanation based on racial change can account for more than a very small portion of the post-bellum rise in the North-South wage gap.

I used the wage evidence in conjunction with price data to construct dual measures of labor productivity in southern agriculture, for 1850 to 1900. The measures build on previous estimates by Moen, primarily by adding additional years. The dual measures point to the same conclusion reached by Moen. Labor productivity in southern agriculture fell sharply after the Civil War. Although productivity eventually began growing again, it did not grow at a sufficient pace to make up for the loss associated with emancipation.

Lastly, the same sources that yielded regional information about wages also contain information on the cost of board. These data unequivocally show that the cost of board in the South, relative to the North, declined after the Civil War, and that this decline was of the same order of magnitude as the decline in the relative wages of farm and common labor in the South. Under reasonable assumptions about income and price elasticities, the data on board suggest that

the relative price of a non-traded good – food produced for local consumption within the South – declined after the War. It is straightforward to construct a simple general equilibrium model that reconciles such a decline with a negative shock to agricultural productivity occasioned by emancipation. But it remains to be seen if additional data can be found that confirm or refute the implications of the data on the cost of board, as well as the specific economic logic implied by the model.

Table 1: Nominal Wages in the South and North, Level and South Relative to the North, 1850-

1900: State-Level Panel Data

Panel A: Average Monthly Wage of Farm Labor With Board + Monthly Value of Board

Year	S. Atlantic	S. Central	North	S. Atlantic /North	S. Central/ North
1850	$12.96	$15.65	$17.82	0.73	0.88
1860	17.18	21.97	20.60	0.83	1.07
1866	17.24	21.52	31.19	0.55	0.69
1869	16.89	21.10	29.46	0.57	0.72
1870	17.99	22.38	32.99	0.55	0.68
1875	16.16	19.08	26.95	0.60	0.71
1879	12.84	16.01	20.25	0.63	0.79
1880	13.40	16.66	22.27	0.60	0.75
1882	15.23	17.43	24.62	0.62	0.71
1885	15.32	16.89	24.07	0.64	0.70
1888	15.56	16.82	23.60	0.66	0.69
1890	15.33	17.06	23.86	0.64	0.72
1892	15.37	17.32	24.29	0.63	0.71
1893	13.90	15.28	23.68	0.59	0.65
1894	13.19	13.92	22.44	0.59	0.62
1895	13.16	13.74	22.81	0.58	0.60
1898	14.02	15.32	23.65	0.59	0.65
1899	14.34	15.71	25.32	0.57	0.62
Grand Mean<1866				0.78	0.98
Grand Mean>=1866				0.60	0.69

Panel B: Daily Wage of Common Labor, Board Not Included

	S. Atlantic	S. Central	North	S. Atlantic /North	S. Central/ North
1850	$0.66	$0.75	$0.87	0.76	0.86
1860	0.83	1.06	1.03	0.81	1.03
1870	0.93	1.18	1.70	0.55	0.69
1880	0.75	0.92	1.25	0.60	0.74
Grand Mean<1866				0.79	0.95
Grand Mean>=1866				0.58	0.72

C. Daily Wage of Carpenters, Board Not Included

	S. Atlantic	S. Central	North	S. Atlantic/ North	S. Central/ North
1850	$1.33	$1.66	$1.36	0.98	1.22
1860	1.64	2.18	1.63	1.01	1.34
1870	2.20	2.73	2.76	0.80	0.99
1880	1.71	2.12	1.95	0.88	1.09
Grand Mean<1866				1.00	1.28
Grand Mean>=1866				0.84	1.04

D. Weekly Wage of Domestics With Board + Weekly Value of Board

	S. Atlantic	S. Central	North	S. Atlantic/North	S. Central/North
1850	$2.21	$2.81	$2.54	0.87	1.11
1860	2.75	3.93	2.97	0.93	1.32
1870	3.08	4.07	4.83	0.64	0.84
1900	2.74	3.77	5.25	0.52	0.72
Grand Mean<1866				0.90	1.22

Grand Mean>=1866				0.58	0.78

Notes to Panel A:

Sources: 1850: DeBow (1854); Kennedy (1864). 1870: computed from manuscript censuses of social statistics for the following states: Arkansas, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Massachusetts, Michigan, New York, Pennsylvania, Tennessee, Texas, and Virginia. 1866, 1869, 1875-1899: Blodgett 1901. Data in original sources refer to monthly wage of farm labor in which board was customarily provided. 1866, 1869, and 1875-1899: Daily value of board was calculated as the difference between the daily wage of farm labor with board and daily wage without board; monthly value of board = 26 x daily value of board. 1850, 1860, 1870: daily value of board = daily wage of common labor without board - daily wage with board. Monthly value of board = 26 x daily value of board.

Notes to Panel B: 1850-70: see notes to Panel A. 1880: computed from Atack-Bateman (1999) sample of manufacturing establishments from 1880 manuscript census of manufacturing

Notes to Panel C: 1850-70: see notes to Panel A; United States Department of Agriculture (1881, p. 145).

Notes to Panel D: Figures are from Lebergott (1964, p. 542). The data pertain to domestics who were paid a weekly cash wage plus room and board. The value of board is imputed at 6 x daily value of board, as described above. I have no way of imputing a value to shelter.

Table 2: Nominal Daily Wages, Board Not Included, of Common Labor in the South and North, Level and South Relative to the North, 1821-1880: Margo Series

A. Ante-bellum: Five-Year Averages, 1825-1860

	S. Atlantic	S. Central	North	S. Atlantic/ North	S. Central/ North
1821-25	$0.64	$0.75	$0.71	0.90	1.06
1826-30	0.63	0.87	0.69	0.91	1.26
1831-35	0.55	0.87	0.75	0.73	0.93
1836-40	0.71	0.88	0.85	0.84	1.04
1841-45	0.56	0.86	0.82	0.68	1.05
1846-50	0.68	0.76	0.85	0.80	0.89
1851-55	0.69	1.00	0.91	0.76	1.10
1856-60	0.88	1.03	1.02	0.86	1.01
Grand Mean				0.83	1.04

B. Post-Bellum: Five-Year Averages, 1866-1880

	S. Atlantic	S. Central	North	S. Atlantic/North	S. Central/North
1866-70	$0.93	$1.23	$1.81	0.51	0.68
1871-75	0.89	1.13	1.72	0.52	0.66
1876-80	0.71	1.00	1.30	0.55	0.77
Grand Mean				0.53	0.70

Source: Panel A, Margo (2000, Table 3A.5). Figures for the North are a weighted average of estimates for Northeast and Midwest; using regional occupation weights for common labor from Margo (2000, Appendix 5B, Table 5B.1).

Panel B: Appendix Table 1. Figures for North are weighted average of estimates for Northeast and Midwest, weights pertain to regional distribution of common labor (available from author on request).

Table 3: The "Treatment" Effects of the Civil War on the North-South Wage Gap: Regression Estimates

	Type of Data	South Atlantic/North	South Central/North
Farm Labor	State	-0.274[a], -0.423[b], -0.315[c], -0.360[e]	-0.383[a], -0.402[b], -0.334[c], -0.465[e]
Common Labor	State	-0.453[b], -0.334[c]	-0.330[b], -0.330[c]
Carpenters	State	-0.291[b], -0.161[c]	-0.249[b], -0.202[c]
Domestics	State	-0.315[b], -0.495[d]	-0.320[b], -0.516[d]
Common Labor	Regional (Margo)	-0.444[f]	-0.445[f]

Figures give average post-1865 decline in nominal (log) wage in South Atlantic or South Central relative to the North. Based on state-level panel regression; see text for details. .All estimates are statistically significant at the 1 percent level. [ ]: sample years in regression: 1850,1860,1870,1880.

[a]sample years in regression: 1850, 1860,1866,1869,1870,1875, 1879, 1880, 1882, 1885, 1888, 1890, 1892-95, 1898-99

[b]sample years in regression: 1850, 1860, 1870

[c]sample years in regression: 1850,1860,1870,1880

[d]sample years in regression: 1850,1860,1870,1900

[e]sample years in regression: 1850,1860,1870,1899

[f]sample years in regression, 1821-1860, 1866-1880

Table 4: Black-White Wage Ratios, Agricultural Labor, 1880 and 1898

	South Atlantic	South Central
Census of Agriculture, 1880 (Ransom-Sutch sample), ratio of average weekly wages	0.97	0.97
USDA, 1898, ratio of average monthly wages with value of board imputed	0.90	0.91

Sources and notes: 1880, Ransom and Sutch (1977) sample of southern farms. Weekly wage of hired labor = total wages paid/total weeks of hired labor. Total weeks of hired labor = weeks of hired white labor + weeks of hired black labor. For each state in sample, average weekly wage of white labor is estimated for farms that hired white labor only; similarly, for each state, average weekly wage of black labor is estimated for farms that hired black labor only. Farms with average weekly wage <$2 or >$5 were excluded. Regional estimates of black and white wages are weighted averages of state estimates using sampling weights supplied by Ransom and Sutch. Figures in table above, row 1, are black/white ratios of regional estimates. 1898: weighted average of state ratios (black/white), weight equal to adult male labor force. Data pertain to monthly wages of farm labor without board. Data were also reported for daily wages but the substantive findings would not change if these data were used instead (see Higgs 1977b, p. 64). Source is Blodgett (1903).

Table 5: The Dual Measure of Labor Productivity in Southern Agriculture, 1850-1900

Year	Price Index	Dual, South Atlantic	Dual, South Central	Per Capita Income
1850	87.5	86.2	71.2	
1860	100.0	100.0	100.0	100.0
1870	149.6	65.7	64.2	56.3
1880	106.8	69.9	68.3	71.9
1890	86.2	104.3	89.4	78.2
1900	87.5	95.4	81.7	91.0

The overall price index (column 2) is a geometric weighted average of commodity-specific price indices. Commodity prices are from Towne and Rasmussen (1960). The weights are based on state level production totals (or stocks) from the published tables of the 1860 census of agriculture, as modified by allowances for seed or (in the case of livestock) animal weights; see Fogel and Engerman (1974) and Yang (1992). The same weights are used, and consequently the same price index, for the South Atlantic and South Central regions. The commodities included in the index and their weights are as follows: milk, 0.128; wheat, 0.049; corn, 0.071; rye, 0.004; oats, 0.003; peas, 0.008; Irish potatoes, 0.003; sweet potatoes, 0.025; barley, 0.0003; buckwheat, 0.0003; hay, 0.003; cotton, 0.362; tobacco, 0.039; rice, 0.0061; sugar, 0.028; molasses, 0.006; cows, 0.028; cattle, 0.072; hogs, 0.171. Dual: wage index, farm labor/price index. Wage indices are from Table 1 (Panel A), setting each region's value to 100 in 1860. Per Capita Income: from Goldin (1979).

Table 6: Nominal Daily Cost of Board in the South and North, Level and South Relative to the North

Year	S. Atlantic	S. Central	North	S. Atlantic /North	S. Central/ North
1850	$0.18	$0.21	$0.24	0.75	0.88
1860	0.24	0.30	0.27	0.89	1.11
1866	0.28	0.35	0.45	0.62	0.78
1869	0.27	0.34	0.43	0.63	0.79
1870	0.30	0.32	0.51	0.59	0.63
1875	0.25	0.29	0.39	0.64	0.74
1879	0.19	0.23	0.28	0.68	0.82
1880	0.18	0.23	0.32	0.56	0.72
1882	0.23	0.23	0.33	0.70	0.70
1885	0.22	0.22	0.31	0.71	0.71
1888	0.22	0.22	0.29	0.76	0.76
1890	0.22	0.21	0.30	0.73	0.70
1892	0.21	0.23	0.31	0.68	0.74
1893	0.16	0.15	0.25	0.64	0.60
1894	0.15	0.14	0.25	0.60	0.56
1895	0.16	0.14	0.26	0.62	0.54
1898	0.17	0.18	0.29	0.59	0.62
1899	0.18	0.18	0.33	0.55	0.55
Grand Mean<1866				0.82	1.00
Grand Mean>=1866				0.64	0.69

Source: 1850, 1860: Census of Social Statistics. Average daily cost of board = average daily wage of common labor board not included - average daily wage of common labor with board. 1866-1899: Blodgett (1901). Average daily cost of board = difference between average daily wage of farm labor, board not included - average daily wage of farm labor with board.

Appendix Table 1: Post-Bellum Annual Series (Margo Estimates)

	S. Atlantic	S. Central	Northeast	North Central
1866	$0.93	$1.30	$2.11	$1.76
1867	0.95	1.28	1.87	1.79
1868	0.95	1.14	1.83	1.71
1869	0.88	1.27	2.02	1.65
1870	0.93	1.18	1.75	1.62
1871	0.87	1.09	1.96	1.7
1872	0.96	1.18	2.03	1.58
1873	0.87	1.18	1.68	1.62
1874	0.86	1.07	1.89	1.58
1875	0.88	1.13	1.79	1.52
1876	0.59	1.10	1.61	1.41
1877	0.73	1.07	1.42	1.31
1878	0.82	1.00	1.32	1.18
1879	0.66	0.92	1.21	1.14
1880	0.75	0.91	1.27	1.22

Source: sample of payrolls collected by the author from Reports of Persons and Articles Hired, Record Group 92, National Archives. Estimates are based on hedonic regressions; dependent variable is log of daily wage (monthly wages are converted to daily wages by dividing by 26 days per month), independent variables include dummies for location of military installation, whether paid on a monthly basis, season of year, job related characteristics associated with unusually high or low wages, occupation (teamsters and watchmen), and year of employment. In some regressions sample sizes are insufficient to include single year dummies for all years. Estimates are benchmarked in 1866, 1869, 1875, 1879, and 1880 using (1866-1879) average daily wage paid to farm labor (board not included) from Blodgett (1901), aggregated to regional level (as above) using free adult male labor force as weights adjusted from cross-regional distribution of common labor. Coefficients of time dummies from regression are used to measure annual change in log wage between benchmark dates, with a positive or negative adjustment to allow for trend implied by benchmark estimates. Further details available from the author on request.

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