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The Contribution of Enslaved Workers to Output and Growth in the Antebellum United States

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The Contribution of Enslaved Workers to Output and Growth in the Antebellum United States

By Mark Stelzner and Sven Beckert

Abstract: Estimating the contribution of enslaved workers to output and growth in the United States during the first half of the nineteenth century is a crucial building block to better understand the contours of nineteenth-century US economic history, and, more generally, the connection between slavery and capitalism. To date, no such estimates exist. In this paper, we use data on slave valuations to calculate the contribution made by enslaved workers to regional and national commodity output in 1839 and 1859 and to the growth in per capita commodity output in the twenty years before the Civil War. We find that enslaved workers were responsible for somewhere between 18.7 and 24.3 percent of the increase in commodity output per capita nationally between 1839 and 1859 – comparable to the increase in commodity output deriving from the beginnings of the Industrial Revolution in New England.

Keywords: slavery, capitalism, growth, antebellum America

JEL Codes: N1, N3, O4

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Introduction

Since 1619, when a group of more than 20 enslaved workers arrived in the port of Jamestown, Virginia, slavery has been a core feature of American history, setting it apart from European states who also trafficked in slaves and used their labor in overseas possessions, but kept the institution itself off their national territories. As noted by contemporaries and passionately discussed by later-day historians, the labor, politics, culture and ideas of millions of enslaved women, men and children left a deep imprint on American life: the legacies of their enslavement, exploitation, discrimination and political repression stamp the United States to this day.

While there is almost universal agreement among scholars on the centrality of slavery to the American experience, there is still considerable debate about the economic importance of the labor of enslaved people in regard to American economic development. In recent years, historians’ return to questions of economic change, coupled with powerful political mobilizations around issues of racial inequality, have brought increased attention to this question, with some scholars arguing that significant connections existed between slavery, economic development, the Industrial Revolution and the unfolding of capitalism in the United States (Johnson, 2013; Baptist, 2013, Beckert, 2014; Beckert and Rockman, 2016; Baptist, 2016; Rosenthal, 2019; Stelzner, 2020). However, other scholars have vehemently opposed the idea that slavery was important to early economic development, making two distinct but interrelated arguments: that American capitalism would have developed without slavery and that slavery was relatively unimportant to U.S. economic growth (Hilt, 2017; Olmstead and Rhode, 2018; Burnard and Riello, 2020).

To address what has become one of the most burning debates in historical research today, we focus on one central aspect of this question by estimating in quantitative terms the contributions enslaved workers made to commodity output in the United States in 1839 and 1859 respectively and then determining what percent of that growth in per capita commodity output derived from slave labor.2 We utilize data on slave prices and valuations to isolate the income

\[2\] Commodity output is the sum of value added by agriculture, mining, manufacturing of both durable and non-durable goods, and construction, including improvements to farmland.
generated by an enslaved person of a given age and gender in a given year. Linking that data to demographic information on enslaved people by state and data on the percent of slaves engaged in commodity production lets us estimate output and growth over the antebellum period. Our calculations show that the increased per capita commodity output of enslaved workers in the United States was a significant source of per capita output growth for both regional economies and the national economy in the two decades before the Civil War. Our calculations also underscore the increasingly precarious position of free non-slave-holding southerners over the same period and the growing income inequality between enslaved southerners, free non-slave-holding southerners, and slaveowners—that is, we shed new light on the distributional effects of antebellum slavery. This more precise estimation of the contribution of enslaved men, women and children to the output and growth of the US economy helps to contextualize current scholarly debates in the United States, enables us to enter into a conversation with European scholars’ new estimates on the importance of slavery to that continent’s economic development, help us better understand United States economic history and provides new data to inform current debates on deeply entrenched racial inequalities, including on the possibility of reparations.

**Literature Review**

Economists, historians and other scholars have long been interested in determining slavery’s economic importance. In fact, the debate started long before slavery in the United States ended. Regardless of whether they viewed slavery positively or negatively, nineteenth-century Americans frequently commented on the connections between slavery and US economic development, and notions of the mutual dependence between not only planters, merchants and manufacturers, but between slave-owning regions and non-slave-owning regions were common. For newspaper editor Hezekiah Niles, that connection was obvious when he observed in 1827 that “[o]n the White Mountains of New Hampshire we find the sugar of Louisiana, and in the plains beyond the Mississippi the cotton cloths of Rhode Island are domesticated. … All these working together, constitute the prosperity and power of the United States.” 3 A Savannah correspondent of the *Southern Cultivator* essentially agreed, when he argued that to slavery “does this country

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largely—very largely—owe its greatness in commerce, manufactures, and its general prosperity.”

The North, abolitionist William Lloyd Garrison stated succinctly, was “a partner in iniquity,”

Enslaved people saw these connections as well, for example when in 1867 a group of freedmen in Virginia justified their claims to land by arguing that “[o]ur wives, our children, our husbands, has been sold over and over again to purchase the lands we now locates upon … And den didn’t we clear the land, and raise the crops of corn, ob tobacco, ob rice, ob sugar, ob ebery ting. And den didn’t dem large cities in de North grow up on de cotton and de sugars and de rice dat we made?”

Many later-day scholars have agreed with these assessments: Callender (1902), Du Bois (1935), Schmidt (1939), and North (1961), for example, argue that cotton, grown mostly by enslaved workers, and its exportation were an important—even prime—mover of growth in the United States throughout much of the antebellum period. Du Bois (p. 5) asserts that “[b]lack labor became the foundation stone not only of the Southern social structure, but of Northern manufacturing and commerce.” North (p. 68) contends that cotton “was the commodity for which foreign demand was significantly increasing… [and that] accounted for over half the value of exports… cotton was the most important proximate cause of expansion” between 1815 and 1843 and continued to be a central driver of national growth up to the Civil War. Income created by cotton via exports and from domestic textile production created demand for other products, thus stimulating growth in other parts of the country. Likewise, historians have argued that cotton, and slavery more generally, was central to economic growth in antebellum America because of its contribution to economic output, importance in international trade, institutional innovations and capital accumulation (Johnson, 2013; Beckert, 2014; Baptist, 2016; Beckert and Rockman, 2016; and Rosenthal 2019). For example, Beckert (2014) argues that at a particular but crucial moment in the history of capitalism, the dispossession of indigenous lands and the enslavement of people of African descent—alongside a market economy—were central to reorienting significant swaths of the global countryside to commodity production and providing raw materials for nascent industries.

This line of argument, often based on the importance of cotton exports, has met considerable resistance. Kravis (1972), for example, shows that exports represented less than one-tenth of total income in the United States before the Civil War.

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4 *Southern Cultivator*, February 26, 1868: 61.
p. 12) explain that “cotton exports were a very small share of national product—less than 5 percent over much of the antebellum period.” And Easterlin (1961), Gallman (1970), and Fishlow (1964) demonstrate that southern farms and plantations were largely food sufficient, and that grain sent from the Midwest down the Mississippi river was destined for New Orleans, northeastern states, and abroad, which lets them argue that southern plantations did not drive demand for food produced in the Midwest.

While these are important points in qualifying the economic significance of slavery in general and cotton in particular, they are also slightly misleading. Some, like Olmstead and Rhode (2018), seem to conflate slavery with cotton and conclude that slavery was relatively unimportant in terms of national output and growth because of (what they consider) the cotton production’s small share in national output. Yet as is implied by Easterlin (1961), Gallman (1970), and Fishlow (1964), enslaved persons were involved in the production of much more than cotton. Indeed, Olmstead and Rhodes (2018; p. 13) themselves explain that “corn, not cotton, was the South’s leading crop in terms of value in 1839 and 1849!” Furthermore, Wright (2006) shows that a significant number of enslaved workers in Kentucky, Missouri, and Virginia were employed in wheat production—despite that commodity being typically associated with free farmers on small family farms. Because corn, wheat, and other foodstuffs produced in the South were often not exported, trade statistics offer an incomplete picture of enslaved workers’ contribution to output and growth in antebellum America.

Second, it is misleading to conclude that cotton was economically insignificant because cotton exports represented only five percent of the nation’s output. This argument is akin to arguing that the automobile industry is unimportant to the contemporary German economy, or that the computer industry is of little consequence to the United States today, assertions that are obviously problematic (Beckert, 2021; Darity, 1990, pp. 120-6; Solow, 1995, pp. 105-6). Moreover, the total value of cotton textile output in the United States in 1859 represented a little more than four percent of total commodity output; yet nobody would argue that the textile industry – which represented the cusp of industrialization at the time – was unimportant.6

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6 This estimate includes the value of inputs, like cotton, used in textile production and the value added from textile production itself. It is derived using data on the value of cotton textile production from Harley (1992) and data on total commodity output from Gallman (1960).
Third, while it is true that the income from cotton production was not spent on Midwestern crops, it did stimulate demand for crops and livestock production in the South (many times on plantations). Furthermore, scholars have shown that cotton production, and slavery more generally, generated demand for Northern-produced goods and services, including coarse textiles and financial services (Beckert and Rockman, 2016; Rockman, 2023). As economists have pointed out, “[t]he slave trade and slavery extended their tendrils into every fissure of the American economy, producing a hothouse effect that created vast national wealth. America’s economic success was built by the unrelenting enslavement of black people. One can hypothesize a counterfactual chain of events where American economic growth took place without slavery, but this is the actual way in which it all began” (Darity Jr. and Mullen, 2020; p. 55). We can never know what US economic development would have looked like without slavery, but we can specify its actual role in the development of the American economy. The idea that capitalism and freedom unfolded hand in hand and are almost interchangeable is appealing, but it should be subject to scrutiny so that these questions are settled by the historical record, not a theoretical or wistful construct of what could have been.

Fortunately, there is much work we can draw on in this project. Earlier scholars have contributed to this discussion, for example, by creating estimates of slaves’ contribution to output. Gunderson (1974) used data on per capita output by state from Gallman (1966) and Easterlin (1961) and data on net yearly earnings from holding an enslaved worker from Evans (1962), adjusted by demographic profiles using data from Fogel and Engerman (1974ab), to calculate the percent of income the free population in a given state derived from the labor of enslaved workers.7 He found that income expropriated from these women, men and children in 1860 represented 42 percent of per capita income of free citizens in Alabama, 29 percent in Mississippi, 24 percent in Texas, and 17 percent in Virginia. Gunderson (p. 992) concludes that “[a]ll of the states in the South had enough of their income dependent on slavery that they could certainly be expected to protest, agonize, resist, and organize against any threats to its existence”—as of course, they did.

These are important contributions, but they have limits. Gunderson’s estimates provide the most encompassing look at income created by enslaved workers, but issues with the data he

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7 Gunderson (1974) also uses rental price data for 1845 through 1860 from Evans (1962) to translate Fogel and Engerman’s (1974ab) values for 1850 to 1860.
utilizes creates the possibility for error that becomes problematic if used to calculate per capita growth during the antebellum period. For example, Evans’ (1962) rental price data, on which Gunderson’s estimations are largely based, do not control for gender or age of enslaved workers. Since the age of the enslaved worker corresponding to the rental price averages in Evans’ data is not clear, it is difficult to calibrate his rental prices with Fogel and Engerman’s (1974ab) demographic profiles. Moreover, Evans only had 157 observations for rental values for the lower South between 1856 and 1860 and 62 for the upper South and 7 for the lower South between 1836 and 1840.8 Thus the regional difference in rental values that he identifies and that Gunderson uses is also potentially problematic, and the use of Evans’ rental data to calculate estimates for 1840 output could more significantly distort estimates.

Other estimates can be used to reveal the importance of slavery to national growth. For example, Gallman (1960, 1866) calculates commodity output per capita and gross national product per capita in 1839 and 1859, and Easterlin (1961) breaks down per capita output by sub-regions. Engerman (1971) uses these estimates to show that the southern economy grew at an average annual rate of 1.45 percent—faster than the growth rate of 1.30 percent for the North. While these figures show that the South was not stagnant, as some earlier historians had argued, they are of limited value for making inferences about the contribution enslaved workers made to output growth. If, for instance, output per capita of enslaved southerners grew at a rate greater than the regional average while output per capita of free southerners remained constant or even fell, the contribution of enslaved workers to regional and national growth in output per capita would be larger, potentially much larger, than that of the South on average. Thus there is substantial room for improvement in identifying enslaved workers’ contribution to growth.

In this paper, we use data on slave valuations and prices from Fogel and Engerman (1974ab), data on occupational distribution of enslaved workers from the Mortality Census of 1860, and theory about how the price of assets relates to the income they generate to calculate slaves’ contribution to commodity output in 1839 and 1859 and growth in per capita commodity output between those years. As we show below, using asset price theory for the antebellum South yields a good first estimate of slaves’ contribution to output and growth because of the long-term orientation of slave ownership, because the slave-profitability debate (Conrad and Meyer, 1958; Evans, 1962, Foust and Swan, 1970; Fogel and Engerman, 1974ab) has already

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8 Evans (1962) had 4,091 observations on slave rental prices for the Upper South between 1836 and 1840.
ruled out large-scale speculation as the cause for the increase in slave prices over the antebellum period, and because analysis of price over earnings ratios from owning an enslaved worker reveals that the degree of sanguinity about the prospects of profiting from slave ownership was relatively constant in 1839 and 1859.

As we will show, we find that per capita growth in commodity output of enslaved workers was responsible for somewhere between 18.7 and 24.3 percent of the increase in commodity output per capita nationally in the twenty years before the Civil War. Thus in the final years of the antebellum period, slavery was an important driver of growth in the United States—almost as significant as the increase in commodity output per capita stemming from productivity growth in the center of America’s Industrial Revolution—New England. Additionally, we find that the commodity output of free non-slave owning southerners fell by 19.38 percent in the South Atlantic, 10.07 percent in the South East Central, and 18.62 percent in the West South Central between 1839 and 1859. Over the same period, as a result of expropriating the increased output of enslaved workers, the income of southern slaveowners increased by 173 percent in the South Atlantic region, 126 percent in the East South Central region, and 65 percent in West South Central region. Thus in the two decades before the Civil War it seems like income inequality increased between enslaved workers, free non-slaveholding southerners, and slaveowners, which had significant political consequences.

*Calculating Slaves’ Contribution to Commodity Output*

Commodity output is the sum of value added from agriculture, mining, manufacturing of both durable and non-durable goods, and construction, including improvements to farmland. We focus on commodity output and not gross national product because estimates of the latter are very rough for the pre-Civil War period. Indeed, Gallman (1960), the originator of the estimates currently referenced for pre-Civil War commodity output and gross national product, stressed “[t]he roughness of the estimates [for gross national product]” (p. 21; fn14). The total contribution of non-commodity output in Gallman (1966), which when added to commodity output yields gross national product, is calculated by assuming the same ratio of productivity per worker in non-commodity and commodity production in 1839 as in 1869. However, productivity per worker is exactly what we want to better understand. In contrast, most of the estimations in the commodity output series have a more solid base. For example, estimates of value added from
agriculture are taken from federal and state censuses of goods produced on the farm. And in the pre-Civil War period, commodity output seems to have represented a much larger percent of economic activity compared to present. Indeed, in 1839 and 1859, gainful workers in commodity production accounted for 82.7 percent and 77.3 percent respectively of all gainful workers in the United States (Fabricant, 1949; Table 2 p. 42). Thus analyzing the contribution of enslaved workers to commodity output gives a more reliable picture of their importance to economic activity overall.

To calculate enslaved workers’ contribution to commodity output in 1839 and 1859, we utilize theory on the pricing of real assets and historical data on the price of enslaved workers to estimate the average income earned from owning an enslaved worker of a given age and gender. For enslaved women, we subtract the wealth they created for their masters through procreation; because this form of wealth creation was not counted in national output figures. We then multiply our calculations for income created by an enslaved worker of a given age group by the number of slaves in each state in that demographic—controlling for the portion of enslaved women, men and children who worked in non-commodity production. Summing across gender and age groups by state and for the nation and repeating this process for 1839 and 1859, lets us capture a snapshot of slaves’ contribution to commodity output.

In terms of asset pricing theory, a rational economic agent in a perfectly competitive economy would set the value of an asset equal to the present value of all future net income streams from holding that asset, discounted to present, plus the change in the asset’s price from selling it at some point in the future, also discounted back to the present. To the degree that economic agents are irrational or their information is imperfect and thus calculations of an asset’s present value are not descriptive or possible, prices would not equal the value of assets’ present value. Indeed, this is often the case (Keynes, 1936; Kindleburger and Aliber, 2011; Thaler, 2015). However, as explained by Keynes (pp. 151 - 160), contrasting western economies of the early twentieth century to those of an earlier time shows that speculation is less prominent when production and ownership have a longer-term orientation or when ownership is in the hands of those managing production.9 In the antebellum South, slave plantations, even the

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9 For example, Keynes (1936, p. 153) states that “as a result of the gradual increase in the portion of the equity in the community’s aggregate capital investment which is owned by persons who do not manage and have a special knowledge of the circumstances, either actual or prospective, of the business in question, the element of real
largest, were family-run enterprises (Wright, 1978; p. 82). In this case, large deviations between price and present value are likely to be less severe. While Keynes was not specifically talking about antebellum America, his explanation of when speculation is more prevalent, along with other aspects of his theory, were intended as general points.

To be sure, an earlier slave-profitability debate centered around this very question. Phillips (1905, 1918) argued that slave prices were high because of speculation. Without any supporting data, Phillips assumed that the productivity of enslaved workers could not have increased fast enough to justify the relative increase in their price. Indeed, his assumption of low and stagnant slave productivity came from openly racist ideas about the impossibility of black productivity growth. Phillips argued that if slave prices were high as a result of speculation, their price would not equal the present value. However, as mentioned above, the slave-profitability debate showed conclusively that slavery was profitable; indeed, highly profitable. While this would not eliminate the possibility of some degree of speculation in slave prices or fluctuations in sanguinity about the earning prospects of owning a slave, it would imply that speculation was not extreme in the late antebellum period the way it has been for stocks or real estate in numerous periods in the twentieth and twenty-first centuries.

Indeed, Kotlikoff (1979; p. 513) argues that the market for enslaved workers was well-functioning in that the prices of enslaved workers represented the sum of their future income discounted to present. He explains that the upside-down U shape of the age-price profile, the higher prices for enslaved men and for those who demonstrated “good conduct,” “all point to careful, calculating transactors, operating in a highly developed market in human beings.” The degree of commodification of enslaved workers was in fact extreme. For example, Kotlikoff concludes that slaveowners had little regard for protecting the families of enslaved workers, selling slaves individually the vast majority of the time, and Johnson (2013) and Sutch (2018; p. 42) explain that enslaved workers “were stripped of all clothing and closely examined to assess muscle development and to discover physical defects such as whipping scars.”

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10 W.E.B. Du Bois (1918) explained that Phillips’ “main picture, is of ‘inert Negroes, the majority of whom are as yet perhaps less efficient in freedom than their forbears were as slaves’ (p. 396).”

11 Additionally, Naidu (2020) argues that prices for slave labor more closely encapsulate the marginal product of workers than do wages for free workers.
To be completely sure about the degree to which speculation was present and thus the degree to which it is safe to use asset pricing theory to estimate earnings, we calculate price over earnings (P/E) ratios for holding slaves in 1839 and 1859. P/E ratios show when a given asset is overvalued (see Shiller, 1981; De Bondt and Thaler, 1985; Thaler, 2015). A high P/E ratio means either that investors think earnings are going to rise in the future or the price will continue to rise (meaning that holding an asset with relatively low earnings is overweighed by expected capital gains). The latter case has been shown to identify bubble formation.\textsuperscript{12}

For owning slaves, the P/E ratio would equal the price of the enslaved workers divided by the income the slaveowner could get from renting the worker for a year. If P/E ratios for slaves were significantly lower in 1839 compared to 1859, it would imply that estimates of slaves’ contribution to growth in commodity output between 1839 and 1859 derived from pricing data would be upwardly biased. As we will see, P/E ratios for slaves were very similar for 1839 and 1859. Thus for the antebellum South, using present value asset pricing theory is a good first estimate for description of asset prices.

In equation (1) we show the yearly net income stream from owning a slave based on present value pricing theory:

\[
\delta_{j,k,t} = P_{j,k,t} - \frac{(1 - \lambda_{j,k,t})P_{j+1,k,t}}{1 + i}
\]  

(1)

\(\delta_{j,k,t}\) is the yearly net income stream from holding a slave of age, \(j\), and gender, \(k\), in year, \(t\). \(P_{j,k,t}\) is the price of a slave of age, \(j\), and gender, \(k\), in year, \(t\). \(P_{j+1,k,t}\) is then the price of a slave that is the same gender but one year older, \(j + 1\). \(\lambda_{j,k,t}\) is the mortality rate for a slave of age, \(j\), and gender, \(k\), in year, \(t\). Thus \(\frac{(1-\lambda_{j,k,t})P_{j+1,k,t}}{1+i}\) is the price of the slave one year down the line, discounted to present, times the probability that the slave lives until the next year.

For a slave owner, \(\delta_{j,k,t}\) for male enslaved workers is equivalent to the price received by the owner if the slave was rented out for one year. For female enslaved workers, we need to subtract the present value of procreation over the lifecycle of the worker from \(\delta_{j,k,t}\) to obtain the

\textsuperscript{12} A bubble is when an asset price is significantly greater than the asset’s present value for a significant period of time.
rental value. As pointed out by Conrad and Meyer (1958), the birth of new enslaved workers was an important form of wealth creation for slaveowners. However, capital formation in the form of new enslaved workers was not counted in commodity output.

Although renting slaves was more common than selling them in antebellum America, the data on renting uncovered by social scientists are considerably sparser or do not control for slave demographics, while data on the value of enslaved women, men and children are abundant.\footnote{Indeed, Fogel and Engerman (1974) calculate that renting slaves occurred more than five times more frequently than selling slaves. However, of their 20,253 data points on slave rental prices, only 560 control for the age of the slave being rented.} For example, Fogel and Engerman (1974) used probate data to compile statistics on slave valuation by gender, age, location, and year for 76,785 different enslaved individuals between 1775 and 1865. We can thus use Fogel and Engerman’s dataset on slave valuation by year, age, gender, and state to estimate a continuous relationship between slave prices and age by gender and region in 1839 and 1859.\footnote{Fogel and Engerman (1974ab) didn’t use this data to calculate income from holding a slave because the framing of the slave-profitability debate took Phillips’ (1905, 1917, 1927) contention that slaves were overvalued as a starting point. As a result, those contributing to this debate had to estimate income deriving from slaves without using slave valuation data. For example, Fogel and Engerman calculated the income created by enslaved people by estimating output of non-tradable goods produced on the plantation and the output elasticity of inputs in the production process.} In Table A.1 in the appendix, we present data on the number of observations in Fogel and Engerman’s dataset by state and region for the years in question.

Figure 1: Valuation of slaves by age and gender in 1839
In Figure 1, we display data on slave valuation for 1839 from Fogel and Engerman (1974), depicted as light gray squares for males and dark gray diamonds for females. We overlay our estimates for the continuous relationship between prices for slaves by age and gender in 1839. The light gray lines correspond to estimated male prices; the dark gray lines to estimated female prices. The dotted lines for estimated male and female prices correspond to the lower South, and the solid lines to the upper South. The upper South includes North Carolina, South Carolina, Maryland, Delaware, and Virginia; and the lower South includes Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Texas, and Tennessee.

Following Kotlikoff (1979), Sutch (2018) and others, the estimates were derived using a fourth-degree polynomial in age while controlling for region:

\[
\ln(P_{i,t}) = \beta_0 + \beta_{1k,t} age_{i,t} + \beta_{2k,t} age_{i,t}^2 + \beta_{3k,t} age_{i,t}^3 + \beta_{4k,t} age_{i,t}^4 + \beta_{5t} region_{i,t} + \epsilon_{i,t}
\]  

(2)

As in equation (1), \(k\) and \(t\) represent gender and year of observation. \(i\) denotes individual.
\( \beta \) represent the coefficients, where \( \beta_{1,k,t}, \beta_{2,k,t}, \beta_{3,k,t}, \) and \( \beta_{4,k,t} \) are gender and year specific. \( \textit{region}_{i,t} \) is a binary variable for the upper and lower South. The estimates for all coefficients identified in equation (2), are statistically significant at the one percent level.\(^{15}\)

From estimates on the continuous distribution of slave prices by age and gender calculated using the estimated coefficients from equation (2) and data on slaveowners’ discount rates and slave mortality rates by age, we can use equation (1) to calculate the yearly net income derived from holding a slave of a given age and gender. For female slaves, we then deduct the present value of wealth created for the slave owner from procreation over the enslaved female’s life cycle. This gives us the income a slave owner would receive from renting the slave, \( r_{j,k,t} \):

\[
 r_{j,k,t} = \begin{cases} 
 \delta_{j,k,t} - \sum_{n=j}^{44} P_{j=0,t} \sigma_j n \prod_{m=j}^{n} \left(1 - \lambda_{j=m,k,t}\right) \frac{(1 + \delta)^{n-j}}{(1 + \delta)^{n-j}}, & \text{men} \\
 \delta_{j,k,t} - \sum_{n=j}^{44} P_{j=0,t} \sigma_j n \prod_{m=j}^{n} \left(1 - \lambda_{j=m,k,t}\right) \frac{(1 + \delta)^{n-j}}{(1 + \delta)^{n-j}}, & \text{women} 
\end{cases}
\]

\( \delta_{j,k,t} \) is the same as in equation (1). The second term in equation (3) represents the present value from wealth created by expected procreation over the lifecycle of an enslaved female worker. \( P_{j=0,t} \) is the price of a enslaved worker when born, i.e. when \( j \) equals zero, and is taken from our estimates from equation (2). \( \sigma_j \) is the fertility rate of the enslaved worker, which is age specific. For \( \sigma_j \), we use estimates from Sutch (1975) for the upper and lower South. \( \prod_{m=j}^{n} \left(1 - \lambda_{j=m,k,t}\right) \) represents the probability that the enslaved worker is alive at age \( n \), and the term in the denominator, \( (1 + \delta)^{n-j} \), discounts the value to the age under analysis.

The rental price of an enslaved worker is not equal to the complete value that worker creates. When an individual in antebellum America rented a slave, he had to pay for room, board, and healthcare for the slave during the rental period. The renter also had to provide the slave with a new set of clothes and shoes at the completion of service (Evans, 1962; Fogel and Engerman, 1974a; Olmstead and Rhode, 2018). Thus the total value created by an enslaved worker equals the sum of the rental fee paid to the slave owner, the cost of room and board for the slave, and the cost of a new suit of clothes and shoes for the worker after completion of service.

\(^{15}\) Because there were relatively few observations for slave valuations in the upper South in 1859, we included data from 1860 in estimation of 1859 prices. To be consistent we also included data from 1840 in the estimation of 1839 prices. As a result, there are 1,924 and 4,002 price observations for 1839 and 1859, respectively.
There are a number of estimates of the average annual cost of maintaining an enslaved person in antebellum America. Conrad and Meyer (1958), for example, estimate out-of-pocket costs for the period between 1840 and 1860 to be $20 to $21 annually. However, these figures do not include the value of food grown on the plantation itself, which is used in the estimation of commodity output. Conrad and Meyer’s estimate of the cost of maintaining a slave thus underestimates slaves’ contribution to commodity output. In contrast, Fogel and Engerman (1974a, p. 151; 1974b; pp. 79, 117, 159 – 160) include the value of food grown on the plantation and find the average cost of maintaining a worker to be $34.13 in 1850 and $42.99 in 1860. And Ransom and Sutch (2001) estimate the value cost of slaves’ consumption to be $28.95 on average for all farms and $32.12 for plantations with 51 or more slaves in 1859. Overall, Vedder (1975; p. 455) explains that “[m]ost estimates of maintenance costs are less than $35 per slave,” and he uses $30 as his best first estimate for the average yearly cost of maintaining a slave in 1860. We use Vedder’s figure of $30 as the average cost per year over the lifecycle of maintaining a slave in 1860. To the degree that this is a lower bound estimate, it will downwardly bias our calculations of slaves’ marginal product and thus downwardly bias our calculations of slaves’ contribution to commodity output.

We also need data on the mortality rate of slaves to calculate the net income and rental values from enslaved workers. Using data from plantation records, Steckel (1979, 1986) calculates slaves’ death rates from birth through age 24. Because his sample overrepresents larger plantations and plantations in regions with high death rates, Steckel potentially overestimates the average death rates of enslaved Americans. At the same time, he finds that, except for the first five years of a slave’s life, their mortality rates are similar to contemporary white men, a finding that parallels the assumptions used by Conrad and Meyer (1958). Steckel’s estimates for the mortality rates of slaves thus represent a good first estimate. For mortality rates for slaves older than 24 years of age, for which Steckel does not estimate values, we use Haines and Avery (1980).

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16 Olmstead and Rhode (2018) use $30 as a lower bound for the average cost of maintaining a slave in 1850.

17 Using data on the changes in the price levels of agricultural goods lets us calculate the cost of providing food and shelter in 1840 (Gallman, 1960; p. 43).

18 Conrad and Meyer (1958; p. 98) use data on the life expectancy of slaves. They conclude that “in 1850 Negroes lived just about as long as whites in” Massachusetts and Maryland.

19 We use the average of the West and Logit models in Haines and Avery (1980, p. 88) as specified by Steckel (1986).
Lastly, we need an estimate of the discount rate of slave holders. The discount rate represents how time is valued. Essentially, a higher discount rate means that there are stronger earning opportunities at present compared to the future. The discount rate is potentially difficult to identify. Conrad and Meyer (1958) use six to eight percent as their discount rate, but they were trying to calculate the economic profitability of slavery relative to investments that were not intertwined with the slave economy. Here, our discount rate represents the percent an individual could have earned on the best available investment and thus the opportunity missed if that individual did not have that money available to invest until one year later. As a result, our discount rate includes the possibility of investing in slaves. Conrad and Meyer found an accounting rate of return from slavery of greater than ten percent, and Evans (1962; p. 217) found even higher rates of return from enslaving workers. Fogel and Engerman (1974) concluded that the average rate of return of slaves was around ten percent. In comparison, in their calculations of the return to capital in manufacturing in 1840, Seaman (1852), Gallman (1960), and Easterlin (1961) use a rate of return of 12.5 percent. To address this potential range of discount rates, we create a lower and upper bound estimate. The lower bound estimate is 10 percent, in accordance with Fogel and Engerman. The upper bound estimate is 12.5 percent, in accordance with Conrad and Meyer and Evans in their calculation of the profitability of slaves and Seaman, Gallman, and Easterlin in their calculations of return to capital in manufacturing in 1840.

Table 1: Percent of Enslaved Workers in Commodity Production

<table>
<thead>
<tr>
<th>REGION</th>
<th>GENDER</th>
<th>AGE GROUP</th>
<th>PERCENT IN COMMODITY PRODUCTION</th>
<th>NUMBER OF OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPPER SOUTH</td>
<td>Female</td>
<td>10 to 19</td>
<td>69.2%</td>
<td>117</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 to 40</td>
<td>79.8%</td>
<td>228</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 40</td>
<td>67.4%</td>
<td>224</td>
</tr>
<tr>
<td>LOWER SOUTH</td>
<td>Female</td>
<td>10 to 19</td>
<td>87.8%</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 to 40</td>
<td>87.5%</td>
<td>184</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 40</td>
<td>73.3%</td>
<td>60</td>
</tr>
<tr>
<td>UPPER SOUTH</td>
<td>Male</td>
<td>10 to 19</td>
<td>77.7%</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 to 40</td>
<td>97.8%</td>
<td>186</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 40</td>
<td>97.7%</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 to 19</td>
<td>91.2%</td>
<td>68</td>
</tr>
</tbody>
</table>
To calculate commodity output deriving from slave labor by state for 1839 and 1859, we multiply the total value created by enslaved workers of a given gender, age, and year against census data on slave demographics by state for 1839 and 1859 for enslaved workers engaged in commodity production.\(^{20}\) In order to identify the distribution of enslaved workers by age group and gender engaged in commodity production, we follow Ransom and Sutch (2001) and use the Mortality Census of 1860. In Table 1, we show data on the percent of enslaved workers engaged in commodity production by region and gender. Commodity production for male slaves varied from field work to a number of artisanal trades. However, field work was predominant. For female workers, virtually all who were engaged in commodity production worked as field hands. As we can see from Table 1, female enslaved workers were more likely to be engaged in non-commodity production – mainly as house servants, nurses, midwives, and cooks. And in the upper South, as compared to the lower, a higher percentage of both men and women were engaged in non-commodity production.

In Table 2, we display our results on total commodity output deriving from slave labor in current dollars by region and for the nation as a whole. Our price and rental price data calculated using equations (1) through (3) is displayed in Table A.2 in the appendix. To contextualize the values in Table 2, we also show data on total commodity output from both slave and free production and data on the percentage of the enslaved population by region and the percent of output deriving from slaves. Estimates of the total commodity output from both slave and free production come from Easterlin (1961) and Gallman (1960). Columns labeled (1) for commodity output from enslaved workers and the percent of total commodity output derived from enslaved workers use our lower bound estimate for the discount rate. Columns labeled (2) use our upper bound estimate for the discount rate.

\(^{20}\) Census data for 1860 can be found online at the following address: [https://www.census.gov/library/publications/1864/dec/1860a.html](https://www.census.gov/library/publications/1864/dec/1860a.html). Census data for 1840 is found in Tucker (1843).
As we can see from Table 2, the enslaved comprised a very large portion of the population in some regions and, according to our calculations, were responsible for a very large portion of commodity output in those regions. Indeed, in the West North Central (Minnesota, Iowa, Missouri, and Kansas), South Atlantic (Virginia, North Carolina, South Carolina, Georgia, and Florida), East South Central (Kentucky, Tennessee, Alabama, and Mississippi), and West South Central (Arkansas, Louisiana, and Oklahoma), the percent of commodity output derived from slaves’ in 1839 and 1859 was higher, in some cases considerably higher, than the percent of the population enslaved. In the south Atlantic and east south central states, the majority of commodity output is attributable to slaves. For the United States as a whole, slaves created between 14.8 and 16.5 percent of total commodity output in 1839 and between 13.0 and 14.8 percent in 1859. To put this in perspective, total wages of all factory, hand, and neighborhood manufacturing workers – that is from all manufacturing industries – in the United States in 1859 represented around 14.2 percent of all commodity output.\(^{21}\) Thus our estimates of slaves’ contribution to output for 1859 is comparable to that from all workers laboring in manufacturing in the same year. This finding highlights how misleading it would be to build an argument about the alleged economic insignificance of slavery on reference to cotton exports as a percent of gross domestic product alone.

\(^{21}\) These estimates were derived using data on the total value of wages for manufacturing workers from the *Statistical Abstract of the U.S.* and data on total commodity output from Gallman (1960).
Table 2: Commodity Output from Enslaved Workers by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>1839</th>
<th></th>
<th>1859</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Commodity Output from Enslaved Workers (millions of current dollars)</td>
<td>Total Commodity Output (millions of current dollars)</td>
<td>Commodity Output from Enslaved Workers (millions of current dollars)</td>
<td>Total Commodity Output Deriving from Slaves (%)</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>New England</td>
<td>0.0</td>
<td>0.0</td>
<td>179</td>
<td>0.0</td>
</tr>
<tr>
<td>Middle Atlantic</td>
<td>4.4</td>
<td>4.8</td>
<td>419</td>
<td>1.0</td>
</tr>
<tr>
<td>East North Central</td>
<td>0.02</td>
<td>0.02</td>
<td>119</td>
<td>0.01</td>
</tr>
<tr>
<td>West North Central</td>
<td>2.7</td>
<td>2.9</td>
<td>18.9</td>
<td>14.1</td>
</tr>
<tr>
<td>South Atlantic</td>
<td>71.1</td>
<td>78.5</td>
<td>142</td>
<td>50.2</td>
</tr>
<tr>
<td>East South Central</td>
<td>59.8</td>
<td>67.4</td>
<td>114</td>
<td>52.3</td>
</tr>
<tr>
<td>West South Central</td>
<td>15.8</td>
<td>17.7</td>
<td>39.3</td>
<td>40.2</td>
</tr>
<tr>
<td>United States</td>
<td>154</td>
<td>171</td>
<td>1,040</td>
<td>14.8</td>
</tr>
</tbody>
</table>

Source: Data on total state output comes from Easterlin (1961) and Gallman (1960). Data on slave output based on authors’ calculations as described in text. New England includes Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. Middle Atlantic includes New York, New Jersey, Pennsylvania, Delaware, and Maryland. East North Central includes Ohio, Indiana, Illinois, Michigan, and Wisconsin. West North Central includes Minnesota, Iowa, Missouri, and Kansas. South Atlantic includes Virginia, North Carolina, South Carolina, Georgia, and Florida. East South Central includes Kentucky, Tennessee, Alabama, and Mississippi. West South Central includes Arkansas, Louisiana, and Oklahoma.
In terms of the comparability of estimates from 1839 and 1859, as mentioned before, it is important that speculation or sanguinity about the future earning potential from owning a slave was similar in both years under question. Using rental price data from Fogel and Engerman (1974ab) and our estimates of slave prices from equation (2), we calculate P/E ratios for 1839 and 1859 for adult male slaves in the upper and lower South. All coefficients in the estimation of average adult male rental prices by region are statistically significant at the one percent level. We find that in 1839 the P/E ratio for a 30-year-old male slave was 11.8 in the upper South and 14.0 in the lower South. In 1859, the P/E ratio for a 30-year-old male slave was 12.0 in the upper South and 13.9 in the lower South. The P/E ratios for the upper and lower South are similar for 1839 and 1859, but there is a consistent difference between regions.

Slaves‘ Contribution to Growth in Commodity Output

To get a better idea of the importance of slavery for regional and national growth in commodity output in antebellum America, we use estimates from other scholars on per capita growth and growth accounting. Per capita commodity output can be disaggregated as follows:

\[
\frac{Y_t}{Pop_t} = \frac{Y_s + Y_f}{Pop_s + Pop_f}
\]

In equation (4), \(Y_t\) is the total commodity output, \(Y_s\) is commodity output derived from enslaved workers, and \(Y_f\) is commodity output derived from free workers. \(Pop_t\) is the total population, \(Pop_s\) is the enslaved population, and \(Pop_f\) is the free population.

The rate of change in per capita commodity output can be disaggregated as follows:

\[
\left(\frac{\bar{Y}_t}{Pop_t}\right) = \frac{Pop_t}{Y_t} \left( h_{Y_s} \frac{\partial Y_s}{\partial t} + h_{Y_f} \frac{\partial Y_f}{\partial t} + h_{Pop_s} \frac{\partial Pop_s}{\partial t} + h_{Pop_f} \frac{\partial Pop_f}{\partial t} \right)
\]

22 In line with our calculations for output, we use rental price data for 1839 and 1840 for average rental prices in 1839, and data for 1859 and 1860 for average rental prices in 1859. Fogel and Engerman’s rental price data has 851 observations for 1839 and 517 observations for 1859.

23 Indeed, these results are exactly the same as those found by Fogel and Engerman (1974a, pp. 103 – 106) in their “index of sanguinity” between 1836 through 1840 and 1856 through 1860.
In equation (5), \( \frac{Y_t}{pop_t} \) is the rate of change of per capita commodity output. \( \frac{\partial Y_s}{\partial t} \) and \( \frac{\partial Y_f}{\partial t} \) are the change in total commodity output produced by enslaved and free workers, respectively. \( \frac{\partial Pop_s}{\partial t} \) and \( \frac{\partial Pop_f}{\partial t} \) are the change in the enslaved and free population, respectively. \( h_{Y_s} \) represents the partial derivative of \( h \), where \( h = \frac{Y_t}{pop_t} \), in terms of output derived from slaves. Accordingly, \( h_{Y_f} \), \( h_{Pop_s} \), and \( h_{Pop_f} \) represent the partial derivative of \( h \) in terms of the subscripted variable. Thus the change in per capita commodity output deriving from a change in the per capita output of slaves, \( \psi \), is the following:

\[
\psi = \frac{h_{Y_s} \frac{\partial Y_s}{\partial t} + h_{Pop_s} \frac{\partial Pop_s}{\partial t}}{\frac{\partial Y_t}{\partial pop_t}}
\]

(6)

In Table 3, we show slaves’ contribution to regional and national growth in commodity output between 1839 and 1859. Data on growth in per capita commodity output comes from Easterlin (1961) and Gallman (1960). Percent of per capita growth deriving from slaves refers to \( \psi \) from equation (6). Because the derivatives of output per capita in terms of output and population (i.e. \( h_{Y_s}, h_{Y_f}, h_{Pop_s}, \) and \( h_{Pop_f} \)) yield the slope at a single point and some of the second derivatives of \( h \) are non-zero, usage of the point values of \( h_{Y_s}, h_{Y_f}, h_{Pop_s}, \) and \( h_{Pop_f} \) for large discrete changes in population and output would create significant error. To get around this problem, we use average values for \( h_{Y_s}, h_{Y_f}, h_{Pop_s}, \) and \( h_{Pop_f} \) along the intervals in question. In the column labeled (1), we use our lower bound estimate for the discount rate, and in the column labeled (2), we use our upper bound estimate for the discount rate.
Table 3: Slaves’ Contribution to Growth in Commodity Output per Capita Between 1839 and 1859

<table>
<thead>
<tr>
<th>Region</th>
<th>Growth in Per Capita Output (%)</th>
<th>Percent of Per Capita Growth Deriving from Slaves (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>New England</td>
<td>44.50</td>
<td>0.0</td>
</tr>
<tr>
<td>Middle Atlantic</td>
<td>34.36</td>
<td>1.37</td>
</tr>
<tr>
<td>East North Central</td>
<td>37.37</td>
<td>0.0</td>
</tr>
<tr>
<td>West North Central</td>
<td>17.38</td>
<td>32.36</td>
</tr>
<tr>
<td>South Atlantic</td>
<td>23.86</td>
<td>123.1</td>
</tr>
<tr>
<td>East South Central</td>
<td>24.24</td>
<td>128.4</td>
</tr>
<tr>
<td>West South Central</td>
<td>6.52</td>
<td>199.0</td>
</tr>
<tr>
<td>United States</td>
<td>33.38</td>
<td>18.7</td>
</tr>
</tbody>
</table>

Source: Data on growth in per capita output, i.e., column 1, comes from Easterlin (1961) and Gallman (1960). Data on slaves’ contribution to growth in output per capita from authors. New England includes Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. Middle Atlantic includes New York, New Jersey, Pennsylvania, Delaware, and Maryland. East North Central includes Ohio, Indiana, Illinois, Michigan, and Wisconsin. West North Central includes Minnesota, Iowa, Missouri, and Kansas. South Atlantic includes Virginia, North Carolina, South Carolina, Georgia, and Florida. East South Central includes Kentucky, Tennessee, Alabama, and Mississippi. West South Central includes Arkansas, Louisiana, and Oklahoma.

As we see, the increase in commodity output per enslaved worker drove per capita growth in the South Atlantic, East South Central, and West South Central. While these estimates may seem large, especially those using the upper bound, that is partially a function of the nature of per capita output growth. Indeed, the contribution of enslaved workers to per capita growth of greater than one hundred percent does not imply a fall in per capita commodity output of free workers of the reciprocal percentage. Free workers would have a negative contribution to overall per capita commodity output growth if the rate of change of output from free workers were less than the rate of change of population of free workers (i.e., \( \frac{\partial Y_f}{\partial t} - h \frac{\partial P_{of}}{\partial t} < 0 \)). However, the
exact contribution to output would not just be the difference between these two rates of change, but would also be a function of the rate of change of output per capita and output for all workers—as can be seen for enslaved workers in equation (6).

Using estimates of the percentage of southern slave-owning households from Wright (1978), we can break down change in real per capita commodity output for free southerners who owned slaves and those who did not. Using the upper bound estimates for the discount rate, between 1839 and 1859 commodity output per capita of free southerners who did not own slaves fell by 19.38 percent in the South Atlantic, 10.07 percent in the East South Central, and 18.62 percent in the West South Central. Part of this fall probably represents a reallocation of production among free non-slave-owning southerners to non-commodity output. However, given the magnitude and the corroborative historical evidence we consider below, it seems that a significant portion of it was a result of a declining position of free non-slave-owning white southerners.

In contrast to the situation of enslaved workers and non-slave-holding free white workers, slaveowners in the South saw dramatic increases in their real per capita commodity income between 1839 and 1859—the result of expropriating the increased output of enslaved workers. Using the upper bound estimates for the discount rate and data from Wright (1978) on slave ownership, we find that on average the real per capita commodity income of slave owners increased by 173 percent, 126 percent, and 65 percent for slaveowners in the South Atlantic, East South Central, and West South Central respectively. Thus inequality between enslaved workers and slave owners increased, and to the degree that the decrease in commodity output per capita of free non-slave-owning southerners was not offset by income from non-commodity production, income inequality also expanded between non-slave-holding free southerners and slave owners.

Other scholars have also highlighted the declining position of non-slave-owning white southerners (Olmstead, 1854; Douglass, 1855; Schluter, 1913; Simkins and Woody, 1932; Du Bois, 1935; Hahn, 1985; Williams, 2008; Merrit, 2017; Teitelman, 2020). Du Bois asserted that non-slave-holding whites were “a forgotten mass of men,” and that the large out-migration of southern whites to the West during the late antebellum period can be explained by their increasingly precarious economic situation. Williams explains that the economic situation of non-slave-holding whites in the South deteriorated between the late 1830s and 1860 as a result of changes in federal law like the Species Circular Act of 1837, and because federal, state, and local
governments were beholden to slaveholders. As the antebellum period progressed, more and more non-slave-holding whites lost their land and were forced into tenancy or onto marginal lands. “By 1860,” Williams claims, “at least 25 percent of southern farmers were tenants, and more were joining their ranks every day” (p. 12). Merritt makes a similar point, arguing that slaveowners used deceit and protection from the law to push “the least affluent yeomen off the land, turning them into tenants and day laborers.” Our calculations of the contributions of slaves to per capita growth in commodity output accords with these accounts of the increasingly dismal situation for non-slave-holding whites.

**Conclusion**

Most important, however, is our finding that for the United States as a whole, the increase in per capita commodity output of enslaved people accounted for somewhere between 18.7 and 24.3 percent of growth in commodity output per capita between 1839 and 1859. This represents a large contribution to national per capita commodity output growth, given that slaves were concentrated in the south and west north central states, and that in 1859, enslaved men, women and children made up just twelve percent of the national population. In comparison, growth in real per capita output from manufacturing, mining, construction, and agriculture in New England, the center of America’s industrial revolution, accounts for 29.2 percent of the increase in national per capita commodity output between 1839 and 1859. It is worth underlining that the percentage of growth in national per capita commodity output deriving from increasing output per enslaved worker was comparable to that derived from increasing output per free manufacturing worker in New England.

These findings potentially also shed light on why the South went to war: the sharpening inequality between free southerners was increasingly politically untenable; for slavery and yeoman farming to co-exist, territorial expansion was required. Indeed, Williams (2010) argues that one of the reasons southern states seceded from the Union and went to war was that slaveholders realized that increasing inequality among whites threatened their position of political authority. They feared the possible sharpening of these inequalities thanks to the new federal government’s opposition to slavery’s expansion, constraints that could only be overcoming by seceding from the Union.
Our findings on the importance of slave labor to economic growth in the United States are also important in the context of recent research on the importance of the slavery complex to European economies. Viewed from Amsterdam, London or Bordeaux, slavery seems far away, but we now know that slavery contributed 5.7 percent to Dutch gross domestic product in 1750, and more than 10 percent to its richest province, Holland (Bosma and Brandon, 2021). More than 40 percent of Dutch economic growth in the eighteenth century was directly connected to slavery.\(^{24}\) In Great Britain, it has been estimated, more than 10 percent of economic activity in the late eighteenth century was related to slavery (Rönnbäck, 2018). And French scholars have observed that 70 percent of eighteenth-century economic growth was directly related to Caribbean slavery (Daudin, 2005 and 2006). Our findings amplify these researchers’ conclusions and confirm that in a society in which slavery decisively stamped the economy of a major portion of the country, the slavery complex’s importance to the national economy must have been significantly greater than in countries without slavery within their national borders that drew economic benefits from the slavery complex located in distant territories.

These findings also confirm that slavery did not come to an end for purely economic reasons. Slavery remained a source of profits, wealth, political power and opportunities for growth, including productivity enhancements, up through the 1860s. The collapse of slavery instead must be located in its political instability, the constant challenges brought by the enslaved, and slavery’s deep reliance on a federal government that legitimized and enabled territorial expansion, native displacement and the continued enslavement of workers. Slavery rested on a peculiar political economy that was challenged by a new political coalition that emerged in the mid-nineteenth century United States (Beckert, 2001). Slavery could inhabit the same economic space as waged labor, but, by mid-century, it could no longer inhabit the same political space (Beckert, 2014).

Finally and crucially, these findings are important to better understand the institution of slavery and its connection to economic output and growth in the United States. Our conclusions suggest that output created by enslaved men, women, and children in 1859 was of a comparable magnitude to the total value of wages received by all manufacturing workers in the United States in 1859 – which represents a lower bound estimate of the value created by all workers in

\(^{24}\) Including the slave trade, the trade and processing of slave-grown agricultural commodities, as well as shipping, insurance and banking services linked to the slave economy.
manufacturing. And the growth in output per enslaved worker in the twenty years before the Civil War represents a contribution to per capita commodity output growth on par with that from the increase in output per worker in New England – the epicenter of the industrial revolution in the United States. These estimates do not consider economic activity, like in insurance, banking, transportation and industrial sectors that were stimulated by the slave economy, and thus represent a lower bound estimate for the overall importance of slavery. However, they do show, as argued by Du Bois (1935), Callender (1902), Schmidt (1939), North (1961), Darity (1990), Johnson (2013), Beckert (2014), Baptist (2016), Beckert and Rockman (2016), and Stelzner (2020), that slavery was important historically for US economic development.
# Appendix

## Table A.1 – Number of Observations by State and Region

<table>
<thead>
<tr>
<th>State/Region</th>
<th>Years</th>
<th>1839 - 1840</th>
<th>1859 - 1860</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Carolina</td>
<td></td>
<td>428</td>
<td>762</td>
</tr>
<tr>
<td>Maryland</td>
<td></td>
<td>604</td>
<td>0</td>
</tr>
<tr>
<td>Virginia</td>
<td></td>
<td>712</td>
<td>703</td>
</tr>
<tr>
<td>South Carolina</td>
<td></td>
<td>683</td>
<td>351</td>
</tr>
<tr>
<td><strong>Upper South Total</strong></td>
<td></td>
<td>2427</td>
<td>1816</td>
</tr>
<tr>
<td>Louisiana</td>
<td></td>
<td>924</td>
<td>2,244</td>
</tr>
<tr>
<td>Tennessee</td>
<td></td>
<td>293</td>
<td>94</td>
</tr>
<tr>
<td>Georgia</td>
<td></td>
<td>191</td>
<td>417</td>
</tr>
<tr>
<td>Mississippi</td>
<td></td>
<td>92</td>
<td>895</td>
</tr>
<tr>
<td><strong>Lower South Total</strong></td>
<td></td>
<td>1500</td>
<td>3650</td>
</tr>
<tr>
<td><strong>South Total</strong></td>
<td></td>
<td>3,927</td>
<td>5466</td>
</tr>
</tbody>
</table>


## Table A.2 – Price and Rental Prices for Enslaved Workers

<table>
<thead>
<tr>
<th>Year</th>
<th>Age</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Price</td>
<td>Yearly Rental Price</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Upper South</td>
<td>Lower South</td>
</tr>
<tr>
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*Source:* Estimation by authors using equations (1) through (3).
References


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