How Did the Slavery Economy Work?

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A shifting historiographical tradition
Abolitionist indictment of slavery before the Civil War rested on 5 propositions:

1. Slavery was dying.
2. Why? Because slavery was, in general, an unprofitable investment.
3. Why? Because the plantation system was inefficient.
4. Slavery resulted in a stagnant Southern economy.
5. Slavery was accompanied by harsh conditions for the typical slave. Basically, a brutal life.

Therefore, abolishing slavery would be good both for the whites and black persons of the south.
Ulrich B. Phillips and the Progressive movement

- Ulrich B. Phillips (1877-1934), who held strongly racist views, publishes *American Negro Slavery* in 1918.

- Immensely influential for two generations of historians.

- Phillips accepts the first 4 propositions of abolitionists, but through careful study of letters and plantation logs, disputes the last.

- He documents that slaves, at least economically, were treated fairly well by the working-class standards of the time:
  - Masters had considerable power over slaves.
  - But slaves were not devoid of influence. The working relationship required concessions for the plantation to run smoothly.

- Modern historians have come to appreciate the degree of agency of slaves.
BE FREE OR DIE
THE AMAZING STORY OF ROBERT SMALLS’ ESCAPE FROM SLAVERY TO UNION HERO

CATE LINEBERRY
Time on the Cross
The Economics of American Negro Slavery

Robert William Fogel
Stanley L. Engerman
The seminal and most influential study is *Time on the Cross* by Robert Fogel and Stanley Engerman, first published in 1974.

10 essential points.

1. The purchase of a slave was highly profitable with rates of return comparable to those in manufacturing.

2. Slavery was not on the verge of extinction, it was strong economically and becoming increasingly entrenched. Only war could eliminate it.

3. Slave holders were optimistic regarding their prospects and increasingly so.

4. Slave agriculture was actually quite efficient and effectively managed with economies of a large-scale operation that was 35% more efficient than northern family farms.

5. The typical slave hand was hard working and more productive than his white counterparts.
Fogel and Engerman, II

6. Slaves employed in industry were as or more productive than their white counterparts. At the eve of the Civil War, slaves in urban areas were increasing at a more rapid rate than in the countryside.

7. The slave family was a stable unit. It was in the economic interest of slaveholders to encourage that stability. Slave sales were largely composed of entire family units or of family members who were at an age when they would normally leave the family. There is little evidence of sexual abuse.

8. The material condition of slaves compared favorably to those of free industrial workers.

9. Slaves were exploited in the sense that some of their output was expropriated. The rate of expropriation was in the neighborhood of 10%.

10. The Southern economy was not stagnating, but growing quite rapidly. Italy did not achieve similar per-capita income levels until the eve of World War II.
Fogel and Engerman argued that Phillips first 4 points were incorrect.

Slavery was repugnant, but it did not fail economically.

In fact, slavery produced excessive profits that prolonged an immoral system.

Slavery also did not cause economic stagnation, but it excluded slaves from sharing in that growth.

Slavery was a deeply dehumanizing system, who created a culture of violence that pervaded all society, even those who did not own slaves.

However, the relationship between slave and slaver involved interdependence and reciprocal accommodations.
• Failure to respect certain rights of slaves would result in low productivity. Often “overtime pay” or other benefits would be offered as incentives.

• There was also a vibrant slave economy. With their free time, slaves produced crops and earned money from their sale.

• Fogel and Engerman follow the cliometricians, who entered the debates over the characteristics of slavery in the 1960s.
  
  • Employ economic, mathematical, and statistical methods to the study of slavery. Kicked off by the “The Economics of Slavery in the Ante Bellum South” (1958) by Alfred Conrad and John Meyer, when they were assistant professors at Harvard.

  • Cliometricians were not welcomed by historians or the defenders of Phillips views: “If cliometricians were asked to write a history of the crucifixion, they would begin by counting nails” (Genovese).
Occupations
The Southern economy as a slave society

- Slave labor is an essential element of the Southern economy, both rural and urban.

- Slaves worked mainly in the fields: around 73% of males and 80% of females were field laborers.

- However, some slaves also in skilled occupations.

- In the city of Charleston, 27% of adult male slaves were skilled artisans.

- Not just true of urban environments, but on plantations as well. In fact, 7% of management positions on plantations were held by slaves and around 12% were skilled craftsman.

- Proportion in skilled or management much lower than for white males.
Work among field laborers

- Among field laborers, the work was varied and included planting and harvesting of a variety of crops, animal husbandry, land improvement, and maintenance of equipment.

- Cotton took up about 34% of labor effort, but the caring for livestock also took a sizable fraction of time, 25%.

- The plantation was a multiproduct establishment, which cultivated a wide variety of crops and produced much of its own clothing.

- Also, an incentive system was used in order to stimulate effort, although violence was used as punishment and was essential to the running of the plantation.
Demographic changes
The redistribution of slaves

- The switch from tobacco to cotton results in a huge change in the geography of slaves.
- Share of slaves in Virginia and Maryland falls from 56% in 1790 to 35% by 1820 and to a mere 15% by the Civil War.
- This migration is due to the world's tremendous demand for cotton. The industrial revolution primarily involves cotton.
- From 1790 to 1860, U.S. production rises from 3000 bales to 4.5 miles bales.
- The lower and western part of the south was more conducive to growing cotton.
- Railroads and steam powered vessels made it relatively low cost to ship cotton to ports for export.
Expansion to the West

- 835,000 slaves are shipped west between 1790 and 1860.
- 85% come from Maryland, Virginia, and Carolinas.
- 5% go to Alabama, Mississippi, Louisiana, and Texas.
- 84% of slaves migrated with their owners and 16% through domestic slave trade.
- Without minimizing the importance (and cruelty) of the domestic slave trade, the idea that Virginia produced slaves largely for export via the slave trade is a myth.
THE LEDGER AND THE CHAIN

HOW DOMESTIC SLAVE TRADERS SHAPED AMERICA

JOSHUA D. ROTHMAN
Domestic slave trade

- Slave sales averaged around 2,700 a year.

- Further, a majority of sales in New Orleans were of slaves already on Louisiana plantations implying that the east-west movement of slaves only marginally accounted for total sales.

- In 1860, about $3 million is earned by the old south through sales, less than 1% of the gross value of agricultural produce.

- Per slave holder, the average profit from the sale of slaves was approximately $4 per year.

- On average, it can be inferred that only one slave holder in 22 sold a slave in any given year, and many of those were sales of slaves from a deceased owner.
What effect did the sales have on slave households and marriages?

- Fogel and Engerman analyze data from slave auctions in New Orleans, the most active market, between 1804 and 1860.

- Records on thousands of sales indicate that 84% of sales involved unmarried individuals and at most 13% of sales involved destruction of marriage.

- 234 children under the age of 13 were sold per year.

- How many were orphans? Because of high mortality rates, roughly 16% of children were orphans.

- Slavers thought that keeping families together was usually a profitable strategy (more later).
The slave labor market
Two market

- Two active markets for purchasing slave labor: a purchase market and a rental market.
- For those needing to permanently increase their work force slaves were generally purchased.
- For those needing only temporary help there was an active rental market.
- Slaves were a long-lived expensive asset and renting slaves was common.
- Interestingly, there does not appear to have been a speculative market in sales.
- Perhaps because transaction costs were high? Speculative sales would result in the loss of labor income and having other capital asset lie idle.
- Fluctuations in prices were rarely high enough to take the risk.
- Also, not a homogenous asset. Varying needs of owners and varying ability of slaves. Prices varied widely depending on these concerns.
The purchase market

- Slaves on ongoing plantations were rarely sold and that is true of slaves born on a given plantation.

- Records of sales from 19 plantations with over 3900 slaves show sales of only 7 slaves over a 65 year period. Of these 6 were born on the plantation in question.

- A total of 3300 slaves were born on these plantations so the ratio of sales to birth is about 0.2%.

- Thus, the breeding of slaves for sale did not exist on these plantations.
The rental market

- The rental market was also active.

- On some occasions slaves would rent themselves out, negotiating terms and operating much like free labor, but remitting a portion of the income to their owner.

- More common among skilled artisans and in urban areas. Why?

- In 1860, 31% of urban slave workers were on hire with 50% on hire in Richmond. Looking at all slave labor, rentals accounted for about 7.5% of labor.

- There also existed rental agencies that intermediated. In Richmond there were 9 such agencies.

- Many contracts were for an annual term. In that case the terms by which the slave was cared for were negotiated. Often they involved a new set of clothes and shoes at the end of the engagement.

- Renters were also responsible for compensating the owner if the slave got ill or ran away.

- The workings of the rental market paints the picture of a flexible labor force.
Profits and prospects
The first serious attempt to calculate plantation profitability was made by the economists Alfred Conrad and John Meyer in 1958.

Prior to their work, most historians' views were based on sketchy evidence and supposition.

 Prevailing view was that plantations were unprofitable and the slave system would have crumbled under its own weight.

Methodology is similar to deriving the return on capital.

Step 1: derive the average capital cost of a slave including the tools provided, the animals used, and of course the price of the slave.

Step 2: derive the gross revenue produced by the slave using estimates of productivity and the price of cotton.

Step 3: derive the net revenue by subtracting maintenance and supervisory cost.
• Calculate the lifetime net revenue using mortality tables.

• The return was found to be between 5 and 8%. In the older less fertile territories around 2-5% and in the more fertile areas between 10-13%.

• The calculation for female slaves is more complex as one has to take account of the value of their offspring. They come up with between 7.1 and 8.1%.

• So even those plantations in the less productive areas earned a profit.

• The paper intensifies the debate.
• Subsequent scholars criticize some of their estimates.

• Some critics claim that Conrad and Meyer overestimated the number of children, the assumption that all slaves lived the average age of life, and underestimated the costs of slave upkeep including medical care, managerial costs, and food and clothing.

• However, Conrad and Meyer also underestimated the productivity of a prime field laborers, and females and overestimated maternity costs as well as the equipment needed by young and older slaves.

• They also made the erroneous assumption that the capital used by a slave fully depreciated at the slaves death.

• The net result is that Conrad and Meyer underestimated the net return. It probably averaged around 10% and the rate of return on males and females were roughly equal.
This rate of return is comparable to rates of return in most non-agricultural businesses.

For example, the rate of return on the 9 most profitable textile firms was around 10% (1844-53), and the rate of return on 12 southern railroads was 8.5% (1850-60).

The prevailing view among historians in the 1950s that owning slaves was largely for conspicuous consumption is not in evidence.

Slave owners appear to have run their plantations in a very businesslike manner.

Evidence can be seen in the relationship between the age profile on price and productivity.
Averages of price relatives by age for male slaves in the Old South
Prices over the life cycle

- Unlikely that 26 year olds were priced twice as high as 10 year olds because they generated twice as much prestige, the previous figure is inconsistent with conspicuous consumption.

- More likely they are based on an earnings profile.

- Earnings are negative until the age of 8 and then peak at 35. And average net income remains positive until the slave is in his late 70s.
Annual net earnings from male slaves by age about 1850, Old South
The contention that slave owners worked their slaves to death to avoid the cost of care when they are old is not born out in the data.

- Tasks could be adjusted. Older women could care for slave children, be seamstresses, or spin cotton. Older men could care for the animals and implements.

- The problem of what to do with the elderly largely arises in urban industrial sectors. It rarely occurs in an agricultural society.

- Some examples of paternalism. Some evidence of laments for slaves that passed away, something that would not occur if the slave was inefficient or troublesome.

- But there is also evidence of cruel punishments on the plantation. The system is inherently inhumane.
Viability
Was slavery on the way out after the American Revolution?

- Slave prices and demand were depressed in the latter years of the War and immediately thereafter.

- But both demand and prices rebound by 1785 and remain quite high in the 1790s. Between 1784 and 1795 they were about 89% of the pre-War price.

- The price decline was due to a rise in supply as slave imports hit all time highs at the time, rising by 79,000 over the decade.

- If slavery was becoming unprofitable, we would not have seen the rise in imports.

- Would it have eventually become unprofitable absent the advent of the cotton gin is an open question.
An index of the course of the demand for slaves, 1772–1810
A cotton bubble?

• Some argue that the tremendous increase in cotton production in the decade prior to the Civil War was an example of over supply and that this oversupply was making slavery unprofitable.

• But the slight downward trend in price and the large increase in supply need not signal irrational oversupply.

• It could and was due to increasing productivity.

• World wide demand for cotton was rising by 7% per year starting in 1846.

• Thus, profits were at their highest during the 1850s.

• And prices were above their trend values.
The course of cotton production, 1791–1861
Fogel and Engerman run a counterfactual experiment.

They regress the change in slave prices on the price of cotton, the output of cotton, the size of the labor force employed in raising cotton, the cost of slave maintenance, and the real interest rate.

The post-War values of all these variables are known.

Using the regression coefficients and assuming that the portion of the labor force devoted to cotton remained constant, the labor force would have grown with the growth of the black population. Also, assuming the cost share and income share of slaves remained constant, they calculate the predicted path of the price of a hypothetical slave.

They conclude the price of slaves would have risen by 1.4% a year from War's end to 1890.
• Additionally, the demand for American cotton increased continually right up to WWI and the amount of land devoted to cotton production grew at 2.06% per annum, which was faster than the growth of the black population.

• Thus, the idea that available land was almost exhausted by the Civil War is groundless as is the idea that cotton growing would not have remained a highly profitable activity.

• Some have argued that the land was being depleted at a high rate.

• Just the opposite, the rate of decline was barely 0.5%.

• Planters were much engaged in developing fertilizers and ways to maintain the quality of the soil.
Westward migration was not due to a search for non-depleted soil, but due to the tremendous growth in demand and the comparative advantage that these areas had in growing cotton.

Technological advances such as the steamboat, which reduced transportation costs and allowed for navigation on shallower rivers as well as those with currents too strong for sail boats. More areas were in reach of port cities.

Advances in management and organization, especially on larger plantations was improving productivity:

- Discussions centered on proper diet, work schedules, punishments and incentives, organization of gangs, and even the construction of dwellings.

- Goal was to create a highly disciplined, specialized, and productive labor force.
Explotation
• Webster’s defines exploitation as:
  1. an unjust or improper use of another person for one's own profit or advantage;
  2. utilization of the labor power of another without giving a just or equivalent return.

• So on both counts slaves were exploited.

• They were at times worked to exhaustion, whipped, sold at auction, separated from their families, raped, and terrorized.

• However, it is important to quantify the exploitation.
  • Not to resurrect in any way the reputation of slave owners. That would be a pointless and malicious.
  • What is important is to resurrect the lives of black slaves and to see what slavery did to their lives.
Food

- The idea that slaves were malnourished has no empirical support.
- Two staples of the slave diet were corn and pork, because they could be stored and eaten year round.
- Other typical foods were beef, mutton, chickens, milk, turnips, peas, squashes, sweet potatoes, apples, plums, oranges, pumpkins, and peaches.
- Foods that could not be produced on the plantation, but were frequent additions to slave diets were salt, sugar, and molasses.
- Less frequent, but not uncommon, provisions included fish, coffee, and whiskey.
- The daily caloric intake exceeded that of free persons in 1879 by roughly 10%.
- Relative to 1964 recommended nutrition guidelines, the typical slave diet contained 110% more protein than the recommendation and was high in other nutrient categories.
The Nutritional Value of the Slave Diet: Average Slave Consumption of Various Nutrients in 1860 as a Percentage of Modern Recommended Daily Allowances

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Percent</th>
</tr>
</thead>
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<td>Protein</td>
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<tr>
<td>Calcium</td>
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</tr>
<tr>
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<tr>
<td>Thiamine</td>
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<tr>
<td>Riboflavin</td>
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<tr>
<td>Niacin</td>
<td>173</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>252</td>
</tr>
</tbody>
</table>
Data on housing is more scarce.

From evidence in the 1860 census, it appears that a typical slave household contained 5.2 persons compared with 5.3 for whites.

Most slaves lived as a single household, but the quality of the housing stock is not well documented.

From traveler’s accounts, there seems to have been a lot of variability ranging from 3-4 room stone houses to one room log cabins without windows.

The typical house was wooden, about 18ft by 20ft, with a stone chimney, no glass windows only shutters, with raised floors constructed of planks.

While that does not appear to be overly accommodative, it contained more space than a typical house in New York City in the 1890s, and it was at a time when most of rural America lived in log cabins.
Regarding clothing the typical issue was:

- For a man, 4 cotton shirts, 4 trousers – 2 of cotton and 2 of wool, one or two pairs of shoes.
- For women, 4 dresses per year or the material to make 4 dresses, and a hat.
- Shoes were generally made of good caliber leather.

Not much else is known other than slaves augmented their clothing with purchases made through their earnings on the plantation.
Medical care

- Medical care was not in general withheld, and it was also up to the standards of the time, which is to say not good.

- Large plantations had their own hospitals and a full-time nurse. Physicians were regularly called upon to treat slaves, usually the same doctor that tended to the plantation owner's family.

- For health reasons, cleanliness was enforced. A sick slave is an unproductive slave.

- The best care was reserved for pregnant women.

- The infant mortality rate was 183 per 1000, around 20% higher than the white rate of 146 and 4% higher than the infant death rates of southern whites of 177.

- Common reasons for infant mortality were whooping cough and cholera.
Life expectancy

- Life expectancy in 1850 was lower than that of white Americans and Englishmen, but comparable to Frenchmen and the Dutch, and higher than Italians of approximately the same period.

- It was also higher than those living in Boston, New York City, and Philadelphia in 1830.

- Suicide rates among slaves were extremely low and significantly less than the white population.
One central organizational structure on plantations was work gangs that allowed plantations to achieve efficient means of production.

The other was the family generally housed in a single family house.

- Allotments of food were by family.
- Strong family attachments encouraged, which made it less likely that a slave would run away.
- By allowing de facto ownership of the house, plots of land for growing vegetables, and small livestock among other things, the planter class created an economic stake for the slave.
- And that stake varied with a slave’s productivity.
The family, II

- Planters relied on the family for the raising of children, although nurseries were provided while mothers were out working in the field.

- Planters provided rewards for marriage and punishment, usually whippings for adultery and even at times for divorce.

- While slave marriage was illegal under most state laws, it was legal under plantation law and provided status to slaves (similar to the divide between manor law and the law of the crown).

- The black family was unmistakably nuclear and patriarchal.
• Hard to measure. For instance, many forms of sexual exploitation do not lead to children.

• Genetic estimates on southern blacks indicate that 1 or 2% can trace their ancestry to a white father.

• There were mixed-race persons in the south, but they were concentrated among free blacks in cities of which it is estimated comprised 39%, compared with 20% of urban slaves and to 9.9% of rural slaves.

• So between 1620 and 1850, the fact that only 7.7% of blacks were of mixed-race speaks to a limited amount of cross racial sex. One was counted as of mixed-race if you were 1/8th black.

• Sexual exploitation would undermine morale and discipline and be harder to keep secret than a mistress.

• Overseers who violated sexual mores were generally punished and often fired. They would have great difficulty being reemployed as an overseer.
• As far as we can tell, black prostitution was rare. Data from Nashville, the only city for which data is available, shows that only 4.3% of prostitutes were black even though 20% of the population was black. All of the women prostitutes were free and light skinned. No slaves involved.

• Nonetheless, “fancy” trade existed.

• A slave owner could earn a higher return from a female field worker.

• The average age of a slave mother conceiving her first child was 22.5. Black families strictly guarded their daughters from sex out of wedlock. Rather than promiscuous mores, slaves appear to have been rather conservative in their mores.
Punishment, rewards, and expropriation, 1

- Whipping was employed on whites in the north during the 17th and 18th centuries, but fell out of favor in the 1800s.

- Whipping was the most common punishment for errant slaves, but others included rescinding various privileges, confinement in stocks, incarceration, sale, and the death penalty.

- Whipping was calibrated to depend on the offense.
  - The records are sparse and basically confined to one plantation whose owner favored whipping. In this case, of the 200 slaves there were 160 whippings over a 2 year period. Roughly half the slaves received a whipping over that period.
  - Many plantation instructions disencouraged the use of whipping or employed it sparingly.
In the north, whipping went out of fashion with the rise of capitalist economies. You could fire someone for shirking and the loss of earnings was born by the worker.

On a plantation, firing was not an option and whipping, if not severe, was a cost effective means of discipline. Punishment practices were driven by the desire to impose the lowest loss of human capital, which the planter owned.

The primary concern of most plantation owners was to maintain a productive work force. To that end, rewards were commonly employed.

Prizes were given to the work gang that had the best performance on a given day or week. Prizes included clothing, tobacco, whisky, and occasionally cash.
Punishment, rewards, and expropriation, III

- Sometimes the award involved a trip to town or an unscheduled holiday.

- If slaves worked on what was their normal time off, they would generally be paid at the going rate for free labor.

- Additionally, slaves that performed well were allowed to work on their own time producing goods such as shingles that they could sell for cash.

- Year end rewards were also common and could average $15-20 per family. To put that in perspective, annual per-capita income was around $100 in 1840.

- Rewards for good work would also come in the form of land. Records indicate that slaves could earn in excess of $100 in a year selling the produce grown on this land.
Some owners drew up revenue sharing agreements.

“You shall have 2/3 of the corn and cotton made on this plantation and as much of the wheat as will reward you for sowing it. I also furnish you with provisions for the year. When your crop is gathered, one third is to be set aside for me. You are then to pay your overseer his part and pay me what I furnish. You are to clothe yourselves, pay your own taxes and doctors fees...and what clear money you make shall be divided equally amongst you in a fair proportion agreeable to the services rendered by each hand. There will be an account of all lost time kept, and those that earn most shall have most.”

There were also longer-term rewards that could take ten years to accumulate. Field laborers could become artisans, artisans might be allowed to move to town where it was easier to sell their services, drivers could move up to be an overseer.

Moving up the hierarchical ladder came with better housing, clothing, and cash bonuses.
The final, but seldom used reward, was manumission. In 1850, the rate was about 1 slave for every 2,000. It could be done through philanthropy or through an agreement allowing the slave to buy his freedom. Some artisans were able to accumulate the fee in 10 years, for others it took much longer.

The reward system resulted in substantial variation in the income distribution among slaves. If we define basic income as the value of food, clothing, shelter and medical care provided to slaves it comes to approximately $48.

Based on existing records, most from Texas, outside income could vary between $40 and $110 for a field hand. Looking at artisans, the price of a prime-age blacksmith was $1700, so a ten-year buyout would imply earnings of at least $170 per year. The highest income found for an artisan was $500 in one year.

It is important not to overstate the degree that a slave could better his lifestyle. Many professions were totally off limits to slaves and the restriction was felt more deeply by the most talented.
An estimate

- An estimate of expropriation is that it averaged 12% of a slave's output.

- Over the life-cycle it varies considerably and planters do not break even until a slave is in his late 20s. In part, the late break-even date is due to the fact that half of slaves do not live to reach the break-even date. Also, income from the plantation was used to sustain unproductive elderly slaves.

- Expropriation, however, is not the only burden imposed on slaves.

- There were other methods of exploitation and tremendous violence.
Violence

- Was punishment essential? Yes, without it the gang system of agriculture would have been unsustainable.

- For example a planting gang consisted of 5 principal tasks. First strong males plowed. This kept up the pace.

- Then harrowers broke up the clods of dirt, followed by drillers who poked holes in the soil, then the planters, and finally rakers who covered the holes.

- An assembly line type of operation that was quite taxing and highly coordinated.

- Economies of scale on plantations were achieved only via slave labor.
• Rather than pool resources, work in gangs, and earn significantly more profits whites chose not to do this. The gains did not compensate for the intensity of the effort.

• Also, after emancipation many planters tried to replicate the gangs by offering salaries that were double what they earned as slaves. No takers. The efficiency of the slave plantation could not be replicated through rewards alone.

• Force and rewards were balanced so as to get the maximum productivity for the least cost.

• Force alone would have been inefficient as the amount required would have reduced productivity and encouraged slaves to run off.
Overseers were given explicit instructions limiting punishment.

“The object of all punishment should be 1st, for correction to deter the offender from a repetition of the offence, ...and 2nd for example to others, shewing them that if they offend, they will likewise receive certain punishment. And these objects and ends of all just punishments can better be obtained by certainty than by the severity of the punishment.”

Rewards for a prime field hand were significant and resulted in the hand earning around 15% more than a free laborer.

“the manager, therefore, should make it a point to report to the proprietor the names and characters of all those who are deserving on account of faithful attention to duty, that they may be further rewarded...”
Outcomes

- The effectiveness of the reward system accounts for the low incidence of slave rebellion.
- One does not see an increase in public nor private expenditure on security based on the density of the slave population nor the size of the plantation.
- On a large plantation the ratio of adult slaves to white males was on the order of 30 to 1.
- As well, the racist attitudes of white society, both in the South and North limited a slaves potential outside options. Illinois banned migration of blacks into the state.
- In fact, things may have been worse for free black persons in the North than the South. Comparing wealth of free black persons in New York and New Orleans, free black persons in New Orleans fared better.
- On a vast majority of plantations the top management positions of overseer and driver was black.
- Thus, black slaves played a crucial role in running the plantation.
Paradoxes of forced labor

- Relative Efficiency (Fogel and Engerman, AER 1977)
  
  Computed as:
  
  \[
  \frac{G_s}{G_n} = \frac{Q_s}{Q_n} \left( \frac{L_s}{L_n} \right)^{a_L} \left( \frac{K_s}{K_n} \right)^{a_K} \left( \frac{T_s}{T_n} \right)^{a_T}
  \]

  which displays relative total factor productivity.

- Fogel and Engerman’s initial calculation yielded 9.2% in 1860.

- Subsequently, they did a more thorough evaluation yielding 34.7% (p 278).

- These measures may not be due to the efficiency of slavery, but to the efficiency of free southern agriculture which is also part of the statistic.
Relative efficiency

- However, the 1860 census indicates that slave plantations were more efficient at both producing cotton and food than free farms.

- The deviation could also be due to favorable market conditions for staple crops in 1860.

- The deviation of relative productivities arises from measurement error of inputs and output, omitted inputs, neglect of potential economies of scale, organizational improvements, differences in product mixes.

- Next one wants to impute the effect of slavery. FE find evidence that slaves worked more days and more hours than free farmers. Their measure of labor is in man-years not man-hours so they could be underestimating the labor input on plantations.

- That mismeasurement would show up as productivity.
Paradoxes of forced labor

- With detailed records of 100 large estates along with evidence of over 5000 estates in the 1860 census, they find that the slave plantations account for 96% of the southern advantage.

<table>
<thead>
<tr>
<th>Size of farm as measured by the number of slaves per farm</th>
<th>Slave exporting states (Old South)</th>
<th>Slave importing states (New South)</th>
<th>All states in Parker-Gallman Sample (Cotton South)</th>
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<td>109.3</td>
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<td>1-15</td>
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<tr>
<td>16-50</td>
<td>124.9</td>
<td>176.1</td>
<td>158.2</td>
</tr>
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<td>51+</td>
<td>135.1</td>
<td>154.7</td>
<td>145.9</td>
</tr>
<tr>
<td>All slave farms</td>
<td>118.9</td>
<td>153.1</td>
<td>140.4</td>
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<tr>
<td>All farms</td>
<td>116.2</td>
<td>144.7</td>
<td>134.7</td>
</tr>
</tbody>
</table>
Paradoxes of forced labor

- It is larger plantations that are more productive. The seemingly greater productivity in medium size plantations in the New South is likely due to an incomplete accounting of omitted products such as home manufactures.

<table>
<thead>
<tr>
<th>Number of slaves per farm</th>
<th>Slave exporting states (Old South)</th>
<th>Slave importing states (New South)</th>
<th>All states in Parker-Gallman sample (Cotton South)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>100.0</td>
<td>100.0</td>
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<tr>
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<td>105.0</td>
<td>112.9</td>
<td>107.7</td>
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<td>16-50</td>
<td>126.9</td>
<td>156.3</td>
<td>144.7</td>
</tr>
<tr>
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<td>137.3</td>
<td>137.3</td>
<td>133.5</td>
</tr>
<tr>
<td>All slave farms</td>
<td>120.8</td>
<td>135.8</td>
<td>128.5</td>
</tr>
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</table>
Fogel and Engerman examine the effects of the possibility of more hours worked by slaves than northern farmers, of the potentially better land of large plantations relative to small ones, and differences in product mix.

In addition they find that large slave plantations were 48% more productive than small free farms. What accounts for this?

- Large farms exploit complementarities in production by concentrating in one of the principle crops: cotton, tobacco, sugar, and rice.

- Coordinated and precisely functioning work gangs working with military like precision.
Paradoxes of forced labor

- Each member of a gang has a precise task that is coordinated with the task of others.

- Plow gangs follow hoe gangs in well choreographed precision. Like a production line coordinated by overseers.

- Time-motion studies used to increase the efficiency of picking.

- Jobs were allocated along the lines of relative efficiency. Strongest were field hands that set the pace of the task. Plow gangs manned by men in their 20s and thirties, while hoe gangs were manned by older men, boys, and prime aged women.

- Secondary crops chosen so that peak effort is complementary with cotton. Corn an excellent complement because it could be planted before the cotton and harvested before or after the cotton.
Paradoxes of forced labor

• Productivity differences also due to the greater intensity of labor rather than additional hours worked, some of which flows from the aforementioned coordination.

• Overall, the biggest advantage of slave labor is found in sugar and the least in tobacco. No evidence that slave labor was more efficient in the cities, hence the high elasticity of demand, nor any evidence it was more efficient outside of the four staples.

• Plantations specialize in these products.

• Greater efficiency is not the same as greater good. Freedom is a highly valued good and the harm done to slaves far exceeded the gains of greater agricultural efficiency.
Conclusion

- Slavery was morally repugnant but, in the South, it was an extremely efficient production arrangement that robbed slaves of the ownership of their own human capital.

- Planters were skilled entrepreneurs that used various motivational techniques to coordinate and incentivize their work force.

- Slaves were highly competent and diligent workers, and entrepreneurial when given the chance.

- Families were relatively stable and the center of slave society.

- While there was widespread abuse, it had to be traded-off against decreased productivity.

- Slavery impacted many other institutions outside the plantation.
Sources