Slave Escape, Prices, and the Fugitive Slave Act of 1850

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Abstract

In the antebellum South, slave transport between the Upper and Deep South was profitable due to a persistent gap in slave prices between the two regions. The gap has been attributed to agricultural productivity differences. This paper examines another potential explanation: regional variation in the chance of successful escape. To do so, the Fugitive Slave Act of 1850 is exploited as a natural experiment. The Act strengthened slave-owners' property rights reducing the likelihood of successful escape. Providing identification, the Act had a bigger impact in border states, where escape to the Free states was arguably easier.

Using data from probate records, estimates suggest a large fraction (between 20 and 30% depending on specification) of the observed price difference disappears after the 1850 Fugitive Slave Act. Estimates are robust to changes in sample restrictions, spatial composition effects, and placebo tests on the Act's implementation date. The findings are also supported by a reduction in the rewards offered and frequency of advertisements for runaways from newspaper advertisements at the time.

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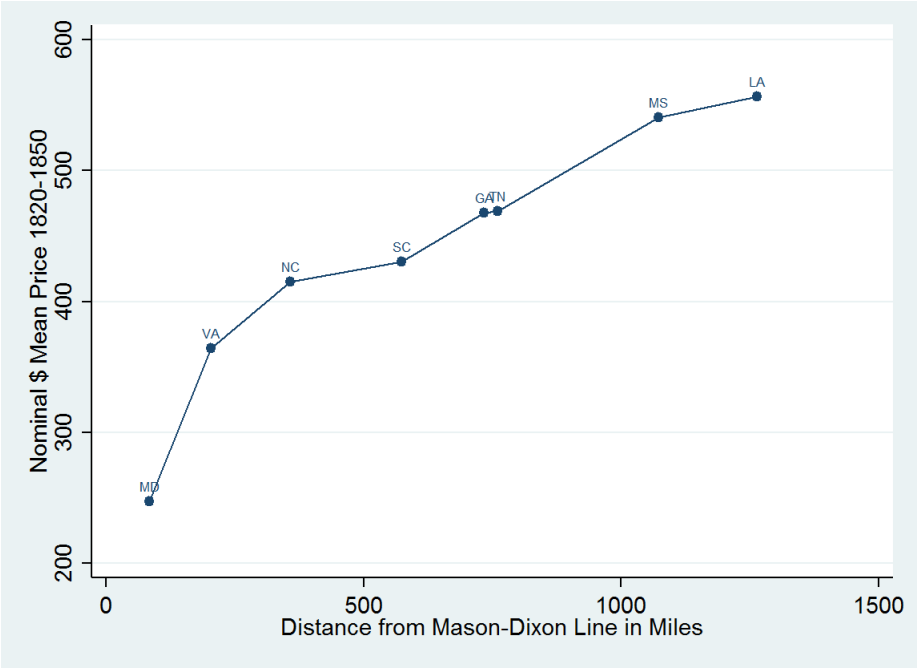
1 Introduction

In the antebellum South, significant price differences between the Upper and Deep south for slaves of the same age, sex, and physical condition persisted for many decades.[1] This paper examines a largely-ignored explanation for this gap: spatial variation in the likelihood of successful escape. Slave escape is a potential cause of price differences because slaves *closer* to Northern states had a shorter route to freedom than a slave who was located in Louisiana or Georgia. All else equal, this would limit willingness to own slaves and depress slave prices in states such as Maryland and Virginia. Consistent with this hypothesis, slave price data shows persistently higher prices in the Deep South relative to the Upper South in the decades leading up to the Civil War. In Figure 1, a clear pattern can be seen: the average price of a slave between 1820 and 1860 across eight southern states (each denoted by their traditional two-letter abbreviations) increases with distance to the Mason-Dixon line.

[1]The Deep South consists of states closer to the Mexican Gulf including Louisiana, Alabama, Mississippi, and Georgia while the Upper South can be thought of as consisting of states close to but geographically south of the Mason-Dixon line, such as Maryland, Delaware, and Virginia.

Figure 1: Observed Prices as a function of Distance from the Mason-Dixon Line 1820-1850



Source: Fogel and Engerman's Probate Appraisal Data-Set (ICPSR, 1974). The figure highlights how the price varied with distance to the Free Northern states. Traditional explanations for this graph stress that slaves were transported south to meet demand driven by agricultural productivity. The correlation between productivity and the distance needed to travel to the North complicates empirical examinations of any potential role for slave escape in price gaps between regions. The Fugitive Slave Act by affecting the likelihood of escape, but not affecting productivity, allows for identification of the effect of escape on prices.

Traditionally, the empirical regularity observed in Figure 1 has been attributed to differences in slave productivity between the regions of the antebellum South. This "traditional" explanation of the price difference highlights the longer growing season, increased hours of sunlight, and fertile soil in the Deep South (see Fogel and Engerman, 1974, or Evans, 1962). With such environmental advantages, slave labor could be used more intensively and at least as efficiently in the Deep South creating a wedge between prices in states in the Upper and Deep South. As one recent example, Olmstead and Rhode (2008), using plantation-level data, measure slave productivity over time and find that a slave in the Deep South picked much more cotton per day compared to a slave in the Upper South throughout the decades before the civil war. Olmstead and Rhode's work provided new insights into a long-running debate on the source and extent of slave efficiency ignited by Fogel and Engerman (1977).

The regional differences in productivity detailed by Olmstead and Rhode suggest productivity surely played a role in the regional pricing of slaves. This paper considers slave escape as a

complimentary cause of the observed price differences. To do so, the paper uses the 1850 Fugitive Slave Act as a natural experiment. The 1850 Act made successful escape to the Free Northern states much less likely and would have had a greater effect on states closer to the Mason-Dixon line. Previous research has suggested that the Act was nothing more than political grandstanding (see Geyl, 1951, or McPherson, 1988). On a purely intuitive level, the evidence offered in the extant literature is neither reliable nor informative. This is because the evidence is based on estimates of the number of runaway slaves from censuses. At the time, the census asked slave-owners how many of their slaves were *currently* fugitives (see Hummel and Weingast (2006) for details). This data is unreliable as it is a point-in-time estimate and not a cumulative estimate of how many have ever run away.[2] Moreover the data is uninformative as it does not consider the effects of the *threat* of escape. If the threat of escape forced slave-owners in the Upper South to treat slaves more "kindly" or required additional private resources to be used for monitoring and security, slave escape could play a major role in slave prices without any actual escapees being observed, ever.

Hummel and Weingast and Freehling (1990), both arguing that slave escape was important, stand out as rare examples of discord in the literature. Freehling argues that runaways would be a greater threat for slaveholders in states bordering the North. Hummel and Weingast agree with Freehling and try to show empirically that runaways were much more common *in border states*. To do so, they use census the data from the 1860 census. They consider the proportion of runaways as a function of the slave population in each state and show that slave runaways were a much bigger issue in states bordering the Free states. However, there are some problems with Hummel and Weingast's approach. If slaves were more valuable in the Deep South (due to productivity differences) then we might expect more resources to be devoted to recapture in the Deep South. Greater monitoring, both public and private, in the Deep South would ensure runaways remained fugitives longer in the border states than in deeper southern states. As the census is a point-in-time snapshot, the data used by Hummel and Weingast to suggest more slaves ran away in border states could simply reflect differences in the time-to-recapture in the two regions rather than differences in the likelihood of runaways.

Additionally, and similarly to papers arguing slave escape was not important, focusing only

[2]That is, if ten slaves who ran away many months ago are considered lost forever, the slave-owner might reasonably answer zero, biasing the data.

on *actual* runaways may be clouding the issue at hand. Even if productivity was equal *and* the census data showed runaways were equally prevalent in the Deep and Upper South, it does not mean that we can dismiss the importance of escape for regional price differences. This is because, in the spirit of Fogel and Engerman , a slave-owner who lived a few miles from the Pennsylvania border might have to treat a slave quite differently compared to a slave-owner in Louisiana, all else equal.

Clouding clean empirical identification, the ease of escape is correlated with both changes in productivity *and* distance from the North. As a result, the only way to accurately measure the effect of escape on regional price differences would be to observe some exogenous change in the likelihood of successful escape that affected one region more than the other, but left productivity unchanged, allowing for a difference-in-differences approach. The 1850 Fugitive Slave Act provides this source of identification, affecting the likelihood of escape but not productivity. It can therefore be exploited as a natural experiment to test how prices were impacted by variation in the risk of escape, shedding new light on the institution of slavery.

The 1850 Act replaced the Fugitive Slave Act of 1793 which had been undermined by the Free states. State legislatures and courts created loopholes and protections for slaves ensuring those made it across the Mason-Dixon line into the North would almost never be returned South. The 1850 Act closed the loopholes, mandated Federal and State officials to assist recapture efforts, allowed bounty hunters to cross into the North to recover slaves, and imposed a fine of $500 (in 1850 dollars) on anyone who assisted fugitive slaves.[3] If the improved property rights afforded by the Act do not close the gap in prices between the regions then it strengthens the argument that *only* agricultural productivity explains the regional price differences. On the other hand, if prices do respond to the Act, it suggests slave escape may have been a much bigger issue than previously thought with significant consequences for our understanding of the peculiar institution.

Estimates of the effect of the Fugitive Slave Act on prices in the Upper South are generated from Fogel and Engerman's probate slave appraisal data-set using a difference-in-difference identification strategy. Fogel and Engerman's data-set contains assessed values and basic demographic information for thousands of slaves in eight Southern states for many years before and after the 1850 Fugitive Slave Act. Estimates, detailed in Section 4 of the paper, indicate that the second

[3]See Section 2 for more details.

Fugitive Slave Act reduced the price difference between the Upper and Deep South for similar slaves by somewhere between 22% and 30% depending on specification. The estimates are robust to alternate specifications, time periods, sample restrictions, and placebo tests. They are then backed up by a secondary data source: advertisements for runaway slaves in daily newspapers in Louisiana, Georgia, Maryland, and Virginia from the same time period.

Importantly, the observed reduction in the regional price gap can only be considered as a *lower* bound on the effect of escape for at least three reasons. First, the law reduced rather than eliminated the chance of successful escape. In other words, if the chance of escape were to have been completely eliminated by the Act the estimates seen in Section 4 would be larger in magnitude. Second, in the absence of the Fugitive Slave Act, prices in the states closer to the North *may* have actually decreased relative to those in the Deep South due to the prevailing political, economic, moral, and legal conditions in neighboring Northern States.[4] Lastly, the Act also mildly strengthened property rights for slave-owners in the Deep South: while escape from the Deep South to the Free states would involve an arduous and incredibly risky 7-8 week journey on foot for a runaway, it was not unheard of.

On face value, finding that stronger property rights matter may surprise few readers. However, the findings of this paper are important as most slavery scholars have argued that the Fugitive Slave Act was neither necessary or relevant. They argue slave-owners' property rights were already strong, relatively few slaves escaped before or after the law, and slaves could not use the threat of escape to their benefit. Such a view restricts slaves' agency, suggesting they were unable to act to improve their "lot." Instead, if the Fugitive Slave Act had a large impact, it suggests the Act was not just a perfunctory nod to Southern interests and that property rights were weaker than previously thought. Such a finding is consistent with slaves having complete agency. Significant increases in slave prices in the Upper South after 1850 would mean the Fugitive Slave Act represented a significant boon to slaveowners' property rights, particularly in border states. In fact, the dismissal of the law in the existing slavery literature is more than a little puzzling. If slave-owners' property rights were strong, slaves didn't escape, and no slave-owners' worried

[4]There was a significant social and political movement towards abolition in the Northern states culminating in the election of President Lincoln in 1860. There were many prominent manumission societies, particularly in Philadelphia who worked to convince (sometimes violently) slave-owners to free their slaves. The Fugitive Slave Act of 1850 *potentially* dampened this movement, minimizing the impact it had on the border states.

about losing their valuable assets, then why would not one, but two Acts of Congress be passed to limit the chances of escape?

Section 2 explains the content and development of the 1850 Fugitive Slave Act and reviews slavery as a rational institution, visiting the relevant literature on slave profitability, escape, and inter-regional trading: Applying economic analysis to the market for slaves only makes sense if economic forces were at play.[5] Section 3 describes Fogel and Engerman's probate appraisal data set and Section 4 presents estimates of the Act's impact on prices. Section 4 also explores the effect of stronger personal liberty laws which were enacted around 1854 in Free states to undermine the 1850 Federal law. Section 5 considers the robustness of these estimates. It also presents additional data on runaway frequency and rewards offered gathered manually from newspaper announcements in the two regions before and after the Act. Section 6 concludes.

2 Slave Ownership, Prices, Trade, and Escape

Approved by Congress in 1793, the first Fugitive Slave Act should have protected slaveowners' property rights. The Act declared aiding an escaped slave illegal and authorized government officials to seize and return runaway slaves. However, the Act failed to determine whether state or federal officials were responsible for the return of escaped slaves (Rosenberg, 1971). Free states pounced upon this ambiguity and undermined the Act with what were known as "Personal Liberty" laws. The laws ensured that a slave would rarely be sent back to their owner in the South. Within this institutional reality, the Underground Railroad helped thousands of slaves escape to the North many years prior to President Lincoln's emancipation proclamation.[6] In response, an enhanced Fugitive Slave Act made its way through Congress in 1850. This second Fugitive Slave Act allowed slave-owners to hire bounty-hunters to recover runaway slaves, mandated state *and* federal officials to assist slave-owners, and levied harsh punishments for interfering in slave recapture. The Act also closed all of the loopholes which had undermined the first Fugitive Slave

[5] If slave-owners were irrational and barbarous, slavery was unprofitable, and slaves were not agents in the true sense of the word then slave prices may not actually respond to market forces as we would expect. It is necessary to establish that slavery was profitable, prices reflected economic conditions, and slaves used the few bargaining chips they had at their disposal to ensure economic analysis is appropriate.

[6] The Underground Railroad gained its name by using the language of the railroad rather than a specific method of transportation. Fugitive slaves would find safe harbor at "stations" which were run by "stationmasters." Financial supporters were "stockholders," and a "conductor" moved fugitives from one station to the next. For further details on the Underground Railroad, see Snodgrass (2008), Still (1968), or Blockson (1987).

Act.

Enhanced personal liberty laws were eventually instituted in Northern states undermining the provisions of the second Fugitive Slave Act.[7] These laws took a number of years to enact and will be exploited as a reverse natural experiment to test if slave escape mattered. The Fugitive Slave Acts of 1793 and 1850 and Northern states' legislative responses to the Act could be taken as evidence that runaways were an issue. At the same time, these legislative changes could be dismissed as political grandstanding. Providing evidence that the Acts were necessary (at least from the point of view of the slave-owner), authors such as Deyle (2005) explored the concerns individual slaveholders had about escape. A particularly enlightening passage taken from correspondence between Thomas Copes of Illinois and his brother Joseph, who lived in Mississippi, reads;

> "The sole object in disposing of [the slave] is the danger of loosing him here. We are on the edge of the state of Illinois, and [slaves] can make their escape across that state to Canada. And do do it every day"[8]

In addition to the direct loss associated with escape, Deyle provides evidence to show that slaves regularly used escape as a bargaining chip to their advantage across all slave states. He highlights that the threat of escape was one of the main ways slave families managed to remain together. Given any hint that they may be separated by sale, such as the appearance of anyone who may be a slave trader, Deyle reports that slave families responded by escaping or with threats of violence.[9] It would be unreasonable to suggest slaves were unable to translate this threat into bargaining power in other areas of conflict.

Campbell (1989), who focused on slavery in Texas, highlights the peculiar dilemma of a slave-owner close to Mexico. Slave-owners, such as a certain "N.B. Hawkins," were afraid to "chastize"

[7] Johnston (1884) notes that these new personal liberty laws generally "prohibited the use of the state's jails for detaining fugitives; provided state officers ... to act as counsel for persons alleged to be fugitives; secured to all such persons the benefits of *habeas corpu*s and trial by jury; required the identity of the fugitive to be proved by two witnesses; forbade state judges and officers to issue writs or give any assistance to the claimant; and imposed a heavy fine and imprisonment for the crime of forcibly seizing or representing as a slave any free person with intent to reduce him to slavery."

[8] Thomas P. Copes to Joseph Copes, Oct. 31, 1846, Copes Papers, Tulane University Library: Special Collections. More information available at http://specialcollections.tulane.edu/archon/?p=collections/findingaid&id=736&q=&rootcontentid=125323#id125323.

[9] In fact, slave traders would place advertisements in newspapers highlighting their discretion and how their unique appearance would not raise suspicion that they were a slave trader.

slaves as they were "right on the line where they could cross into Mexico and be free" (pp. 179-180). Interestingly, the route of escape for slaves in states such as Louisiana, Alabama, and Georgia was almost always to proceed north, rather than south to Mexico. Campbell finds that while there were more than 100,000 slaves in Texas in 1855, perhaps no more than 4,000 slaves in total had ever escaped to Mexico by that date. For many slaves the prospect of beginning a free life in Mexico may not have been very attractive and would be reason enough to try to escape northwards. However, regardless of slaves' attitudes towards a life in Mexico, Texan law and institutions were not favorable to slaves attempting to runaway to Mexico. In 1846, the Texas legislature created an incentivized patrol system granting slaveholders power to search places suspected of harboring escaped slaves. The rewards for capturing escaped slaves were divided among patrol members and "paterollers" became feared by slaves. For slaves who were not indentured in Texas, the journey through Texas from other states would have been quite difficult. This is because, in 1840, an act of Congress prohibited "free persons of color" in the state. Under the law, a slave who absconded from Louisiana or Alabama and wanted to make it to Mexico would be re-enslaved immediately in Texas regardless of their actual status.

Given that Deyle finds evidence that sales occurred in order to minimize the chance of loss from runaway slaves and that both Campbell and Deyle report instances where slaves used both the explicit and implicit threat of escape to improve their "lot," it is easy to imagine that the threat of escape might explain a portion of the price gap between the Upper and Deep South. Unfortunately, the literature on runaway slaves has been distracted by trying to find an accurate measure of the number of slaves who escaped, if any. Having found little evidence of successful escape many authors have suggested that runaways were not an issue at all, including McPherson (1988) and Geyl (1951). Geyl determined that runaways were so rare that the 1850 Fugitive Slave Act was mere symbolism and "[s]outherners clung to the law because they desired to have from the North an acknowledgment of their right rather than because of the material advantage." As mentioned earlier, Hummel and Weingast (2006) criticize Geyl's dismissal of the runaway problem, siding with Freehling (1990) who suggested that runaways were a much larger issue for slave-owners in border states. Freehling contends that the vulnerability of border state slave-owners contributed to a retreat of slavery toward the Deep South and also created a powerful special interest group who demanded Northern states comply with the Fugitive Slave Acts of 1793 and 1850. Hummel

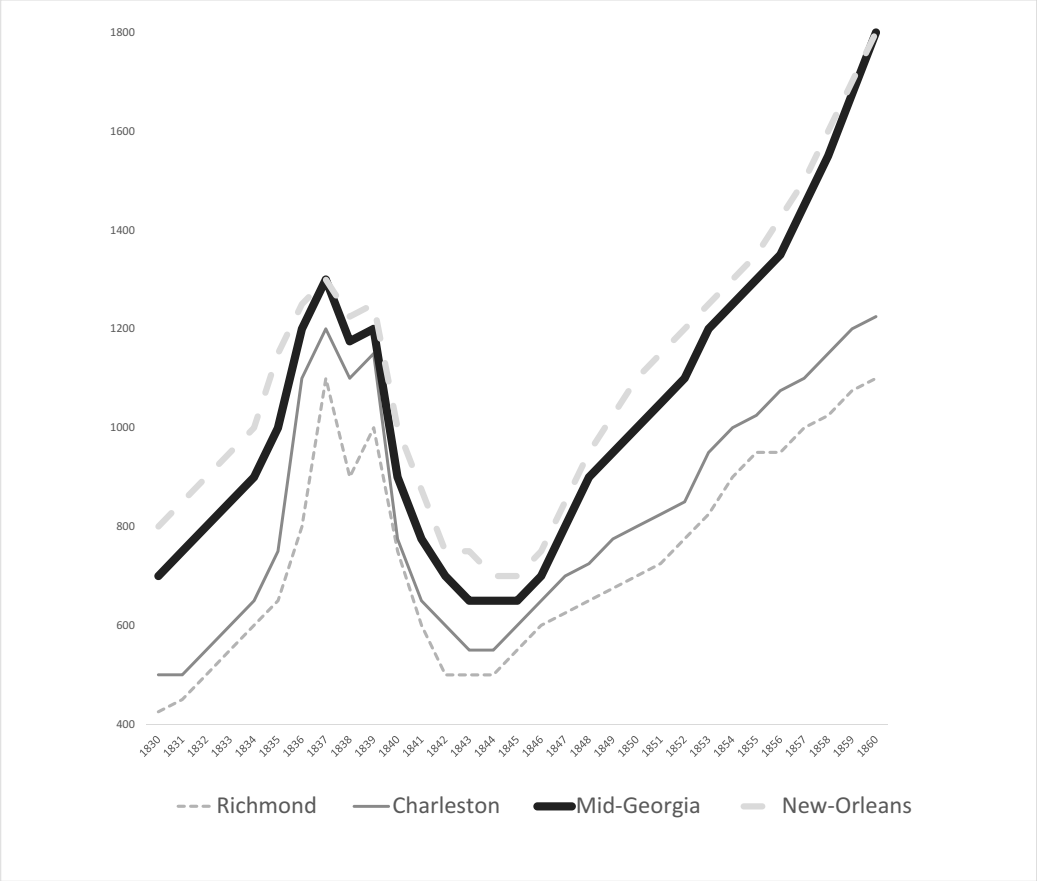
and Weingast highlight that Delaware, Maryland, Virginia, Kentucky, and Missouri combined to account for more than half of all runaways listed in the 1850 and 1860 censuses. These five states contained less than a fourth of the total slave population in 1860.

However, both Freehling and Hummel and Weingast take an unnecessarily narrow view of the effect of escape on prices. They only consider how actual escapees affect prices but fail to consider how the *threat* of escape could also translate into lower prices. A border state slave-owner concerned about runaways had to make staying the relatively more attractive option. The Fugitive Slave Act significantly altered the terms of this implicit negotiation reducing the chance of successful escape for a slave. The literature has not adequately examined the relationship between slave-owner and slave through this lens and has therefore missed how the potential for escape affected prices in the various regions of the South.

Instead, the price differences observed have been ascribed to productivity differences. Of course, any price gap between regions would be expected to close due to trade. However, the risks associated with moving slaves in the 19th century were not trivial. As a result, the price gap persisted for many years (see Figure 2). However, transportation was so arduous that it had to be managed by specialized "slave traders." These traders traveled to the Upper South, purchased slaves to form a "lot," and made their way back to the deep South with the slaves connected by chains in a "coffle." Daily progress was painstakingly slow: coffles frequently featured 100 or more slaves chained together and it took "7 to 8 weeks to travel from the Chesapeake to Mississippi in good weather" (Deyle, p. 99). On a daily basis, success and safety were threatened not only by abolitionists, theft, and the elements, but also by the risk of slaves engineering their own escape or becoming violent. In addition, before and during their departure to the south slave traders expenses would be significant. Slaves who were to be transported had to be housed in "pens" and the slave trader had to finance food and lodging for the slaves and wages paid to employees ("drivers") during the journey south.[10]

[10]Many larger slave trading operations eventually formed and used rail and sea to transport slaves quicker albeit at increased cost. Again. see Deyle, p. 106-111.

Figure 2: Slave Prices 1830-1860



Source: Evans (1962, Table 8, p. 199).

Due to the challenges of moving slaves southwards, it is not surprising that the price of slaves in the Upper South was persistently lower than prices in the Deep South. The movement of slaves was laborious, financially risky, and physically dangerous to both the trader and to the slave. The gains to those who successfully managed to transport slaves south were significant, but the costs were not trivial. [11]

[11] Many slaves who were moved to the Deep South simply traveled south with their owner. However, when the importation of slaves was outlawed in 1808, the domestic market for slaves began to grow and many slaves were sold from their existing owners in the Upper South to new owners in the Deep South.

Authors who have studied the internal slave trade suggest that somewhere between half a million to a million slaves were transported south between 1820 and 1860. However, Historians and Economic Historians have debated these estimates for the last century. The main issue of debate was whether or not most slaves were simply sold or whether they moved with their owner. The distinction is debated only because a slave sale would mean splitting up a family and would be evidence of the barbaric nature of slavery. Fogel and Engerman estimated the total number of slaves who moved to the South was about 686,000 in *Time on the Cross*. Crucially, they argued that over 80% of these were migrants who moved with their owners and, importantly, their family. Fogel and Engerman claimed relatively few slaves were *sold*. Their findings corresponded quite well with the 724,000 slaves estimated to have been transported by Collins (1904). More recently, Tadman (1989) attempted to resolve this bone of contention. Taking issue with Fogel and Engerman's data and methods, suggesting many more slaves were sold than Fogel and Engerman claimed.

This paper relies on a sophisticated response to the Fugitive Slave Act by participants in the slave trade, including enslaved individuals. If slavery was irrational and unprofitable it may be fair to question if the participants can be relied upon to change their behavior in response to economic incentives. The early literature on slavery appeared to suggest that the entire institution was irrational. Authors in the so-called "Phillips" tradition maintained that the entire institution was unprofitable, inefficient, and barbaric.[12] Phillips (1918) himself focused only on the economics of slavery. He gathered data from plantation documents, probate records, and bills of sales, and provided quantitative evidence in support of his propositions. In particular, he claimed (p. 391-392) that;

> "by the close of the 'fifties it is fairly certain that no slaveholders but those few whose plantations lay in the most advantageous parts of the cotton and sugar districts and whose managerial ability was exceptionally great were earning anything beyond what would cover their maintenance and carrying charges."

Authors throughout the early 20th century, such as Frederic Bancroft and Ralph Flanders, substantively agreed. Flanders (1930) claimed that "[i]t cannot be denied that slave labor was expensive and inefficient." Bancroft (1931) was less certain the enterprise was unprofitable but was convinced that the institution was barbaric.[13] However, modern econometric methods have shown the slave trade, prices, management, and ownership to be quite rational and profitable even if it was perhaps not "optimal."[14]

Controversially, some authors have claimed that slavery was not as barbaric as Bancroft and others maintained. The first of these claims appears to have been made by Conrad and Meyer (1958) who compile evidence on the costs of maintenance and purchase prices, and compare slav-

[12]The idea of slavery being unprofitable stretches back to the principles of liberty espoused by Adam Smith in 1776. Smith's argument was that the work of free men "comes cheaper in the end than the work performed by slaves."

[13]Via correspondence with those who were actively involved in the slave trade he attempted to expose the underbelly of the slave trade. Bancroft detailed the "breeding" and "rearing" of slaves for future sale. Bancroft also discredited the notion that traders were social outcasts. Instead, he found that major traders were part of the highest classes of Southern society.

[14]Evans (1962) explains that the long-running argument over the profitability of slavery in the antebellum South was clouded by the difficulty in establishing what counted as profit, what expenses a slave-owner incurred over the life of the slave, how slave labor compared to freely provided labor, and how the market for cotton determined the demand for and thus the price of slaves. By clearly defining the costs and benefits to slave ownership, and examining data on slave markets and the returns to alternative investments, Evans argued that the rate of return on expenditure on slaves was more than adequate and that slavery was booming right up until the Union army prevailed in the American Civil war.

ery to alternative investments such as bonds and stocks. They conclude that;

1. Slavery was profitable for the whole South, rather than pockets as claimed by Phillips;
2. The institution was stable, and not self-destructive as claimed by Bancroft;
3. Slave territories would have expanded in the absence of the Civil War, rather than collapsing;
4. If the profitability or suitability of cotton fell, surplus slaves would have been turned towards other forms of economic development.

In *Time on the Cross*, Fogel and Engerman furthered these claims. Combining census data, transcripts of oral interviews, and plantation records they discover slaves' lives were similar to free laborers, noting that life was very hard for both.[15] Morally repugnant practices such as slave "breeding" were found to be uncommon with slaves regularly being allocated plots, encouraged to maintain families, and given significant plantation responsibilities beyond stereotypical menial labor.

This is important because evidence of rational pricing of slave characteristics is suggestive of rational behavior within the institution as a whole. It would be surprising if slave-owners reduced or increased prices paid in response to defects or strengths while failing to consider the overall profitability of the purchase. The approach and findings of Fogel and Engerman and others (such as Kotlikoff, 1979) who examine slavery in an economically rational light seems to have struck a cord.[16] Whaples (1995), in a survey of areas of agreement (and disagreement) among Economic Historians, found near *unanimity* among members of the profession that;

1. Slavery was not a system irrationally kept in existence by plantation owners and that
2. The slave system was not economically moribund on the eve of the Civil War.[17]

[15] They calculated that between "the value of housing, clothing, food and other benefits received by the slaves", the "slave field hand received approximately ninety percent of the income produced." Fogel and Engerman's mathematically rigorous approach and their associated findings were highly controversial and Gutman (1975) was one of many to critique Fogel and Engerman's methods, data collection, and conclusions.

[16] Kotlikoff, using data on slave auctions in New Orleans, focused only on how slave prices were determined rather than directly on the profitability of the institution and concluded that "[t]he pricing of slaves in New Orleans suggests a highly competitive and economically 'rational' market differing in few respects from a market in live stock."

[17] Moreover, the behavior of individuals undermines the argument against the profitability of slavery. First, slaves were traded for considerable amounts in what appears to be a very active and well-organized market for many decades (if not centuries). Second, planters expended significant resources and managed to have Federal laws enacted to help them re-capture escaped slaves. Thirdly, Southern planters were willing to secede from the Union and fight a civil war to maintain the institution. It would be surprising if even one, never mind all, of these events occurred in the absence of an unprofitable institution.

Lastly, it is worth noting that the literature has hesitated to exploit the regulatory changes brought about by the Fugitive Slave laws. This is odd only because so many authors have attempted to "rationalize" slavery and the Fugitive Slave Act provides a simple test of whether participants behavior was economically rational within the institution of slavery. The estimates presented in Section 4 show that, as usual, property rights and incentives mattered.[18]

3 Probate Appraisal Data

The Inter-university Consortium for Political and Social Research (ICPSR) maintains a data-set of probate-related slave sales and appraisals that took place from 1775 to 1865 in eight states of the southern United States: Virginia, Maryland, North Carolina, South Carolina, Louisiana, Tennessee, Georgia, and Mississippi.[19] For the purpose of this analysis, Virginia, Maryland, and North Carolina are considered to be the Upper South, while South Carolina, Louisiana, Tennessee, Georgia, and Mississippi are part of the Deep South.

In total, 76,785 records from 1775-1865 appear in the data. The data were obtained from probate records on deposit at the Genealogical Society Library of the Church of Jesus Christ of Latter-Day Saints in Salt Lake City, Utah. The data-set documents the sale locations and appraised values (and in some cases sale price) of slaves, as well as the slaves' age, sex, skills, and sometimes condition of health. In the data-set there are records for 43,670 (56.87%) males and 32,726 (42.62%) females, there are 389 records where the sex of the appraised slave was not recorded or was unknown. These were dropped completely from the analysis. Table 1 shows the distribution of the probate records across states.

[18] As slave-owners property rights improved and slaves could no longer use the threat of escape to their advantage, prices for slaves increased. The fact that slave-owners clamored for a Fugitive Slave Act which reinforced the institution and increased slave prices in the Upper South indicates slaves were previously fully exploiting any advantages that they could. They were not inhuman creatures, unable and unwilling to act in their own interest, but instead were resourceful, rational, and above-all tenacious in the face of extreme adversity.

[19] http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/07421/version/3

Table 1: Distribution of Probate Records, by State 1775-1865

UPPER SOUTH

	Frequency	%Male	Age (Male)	Age (Female)
North Carolina	9,798	58.7	22.7	21.9
Maryland	16,417	53.2	21.4	20.4
Virginia	9,643	59.5	24.0	21.0
Sub-Total	35,858	56.4	21.9	20.6

DEEP SOUTH

	Frequency	%Male	Age (Male)	Age (Female)
South Carolina	6,109	57.3	23.9	24.0
Louisiana	23,900	59.2	27.9	25.5
Tennessee	1,318	59.9	21.8	20.3
Georgia	3,876	55.4	24.8	24.6
Mississippi	5,724	53.6	25.4	24.5
Sub-Total	40,927	57.8	26.9	25.0
Total	76,785	56.9	25.1	23.3

Source: Fogel and Engerman's Probate Appraisal Data-Set (ICPSR, 1974).

As this analysis is focused on the effect of the 1850 Fugitive Slave Act in a difference-in-difference framework, the data actually used in the rest of the paper is restricted to the period immediately before and after the act to avoid picking up the effect of other events.[20] Specifically, the data is initially restricted to the 8 years from 1846 to 1853 inclusive. This restriction identifies over 14,000 probate records. While the majority of slaves were appraised for probate purposes, many have no appraisal record. For some, there is a listed sale price which can potentially be used as a substitute for appraisal value. For the 179 records that have neither a sale nor appraisal value, the record was dropped from the analysis leaving just over 13,000 records. One outlier, with a reported value of $525,000 was also eliminated. All other records have an appraised value

[20]Such as court decisions as in *Prigg v Pennsylvania*, 41 U.S. 539 (1842) which strengthened property rights for slave-owners or personal liberty laws re-enacted in Northern States from 1854 onwards.

of <$2,000.

In addition, slaves with listed "defects" were eliminated. Given that at least 30 different "defects" were reported in the data, attempting to identify or consider the effects of a defect would unnecessarily confuse the analysis. Moreover, the defects listed range from being a "girl", a "fellow", an "orphan" or being "small" to a real productivity issue such as a slave having cancer or being deaf. To avoid making a bias-introducing judgment on which of these defects would be considered a "real" defect they are all eliminated. Lastly, only those who were 10 or older at the time of appraisal are considered. This is because the appraisal of children is not likely to represent meaningful information. Numerous states had laws prohibiting the separate sale of slaves under 10 years of age (see Deyle, p. 52). Moreover, at such a young age, successful escape was likely not a consideration for a child. The appraised value of the child was also likely to be hard to separate from that of the child's parent and it is possible that children were appraised under the assumption that they would be kept with their parents. As Deyle notes, it was the case that "such young children were more of a liability than an asset." As a result, children under 10 were dropped from the analysis. The significant proportion of small children in the sample is consistent with the demographics of the slave population on the eve of the civil war. Few slaves lived into old age, women birthed many children, many of whom did not make it to adulthood. In 1860, almost half of the black population (of which the majority were slaves) were under 16 years of age. [21] Table 2 presents summary statistics for the remaining 8,202 probate records by state and region for males and females. North Carolina appears as an Upper South state in the table despite appearing more similar to its (generally) more southern neighbors South Carolina and Tennessee.[22]

[21] Based on the 1% 1860 census extract, available at IPUMS (see Ruggles et al., 2010).

[22] The unavoidably subjective classification of North Carolina as Upper South suggests a natural robustness check would be to examine the effect of excluding North Carolina from the analysis completely.

Table 2: Summary Statistics by State 1846-1853

State	Observations	Rel. Freq	% Male	Age (Female)	Age (Male)	Price (Female)	Price (Male)
North Carolina	275	20.0%	61.8%	22.9	24.2	$ 500.66	$ 673.73
Maryland	790	57.4%	57.3%	27.8	27.9	$ 308.80	$ 437.04
Virgina	312	22.7%	60.3%	22.9	28.2	$ 443.06	$ 522.50
Upper South Weighted Total	1377	100.0%	58.9%	25.7	27.2	$ 377.54	$ 503.67
South Carolina	465	5.7%	60.9%	28.1	26.7	$ 436.87	$ 606.29
Louisiana	5479	66.8%	59.8%	27.9	30.4	$ 503.06	$ 672.84
Tennessee	30	0.4%	66.7%	19.9	26.0	$ 526.30	$ 611.35
Georgia	860	10.5%	54.0%	28.2	28.3	$ 469.70	$ 640.99
Mississippi	1368	16.7%	53.1%	29.1	29.7	$ 554.04	$ 682.05
Deep South Weighted Total	8202	100.0%	58.2%	28.1	29.8	$ 504.40	$ 667.04

Source: Fogel and Engerman's Probate Appraisal Data-Set (ICPSR, 1974).

Note in Table 2 that there were few appraised slaves in the Upper South relative to the Deep South that met the sample criteria. The slaves who were in the Upper South in the time period of interest have a similar ratio of male to females but appear to be younger, in general, than those in the Deep South. Census records indicate that in 1850 there were a total of 834,921 slaves living in Maryland, Virginia, and North Carolina. In the states of South Carolina, Louisiana, Tennessee, Georgia, and Mississippi, there were 1,106,163 slaves. Given the variation in population the probate records could be expected to contain more records for the Deep South. However, the almost 7:1 ratio of valid observations is well in excess of the population ratio and suggests problems may exist with the selection of the data. At the same time, there are quite a few plausible explanations for the observed ratio. First, Fogel and Engerman (among others) note that the largest plantation operations were in the Deep South. The number of slaves subject to probate appraisal upon the death of an average slave-holder is dependent upon the size of their plantation. As the largest plantations were in the Deep South, more slaves would be appraised in probate records from that area. Second, while arguing about the exact number who were moved, the existing slave trade literature indicated many slaves migrated south *with* their owners. It is not hard to imagine, given that the scale of operations was shown to matter for the profitability of a plantation, that the Deep South would first lure slave-owners who had a large number of slaves. Thirdly, the relationship between the number of slaves owned and the age of the slaveholder can be expected to

be at least weakly positive. If the lure of the south was strongest for relatively larger (in terms of slave-holdings), older slave-owners then slave-owner deaths and associated probate records will be stacked towards the Deep South. Slave-owners who have more slaves and are older than those who *do not* move will cause many more probate records to appear in the Deep South than in the areas that they moved from.

The potential relationship between the age of slaveholders and migration, the scale advantages of larger plantations, and the already larger slave population in the Deep South combine to suggest that the probate records observed may be considered as reasonably representative of the population studied. This assertion is backed up by the careful work of Choo and Eid (2008) who build on the work of Greenwald and Glasspiegel (1983). Choo and Eid examine how slaves from different regions sold at auction in New Orleans compared to one another. They test an Alchien-Allen style explanation for price differences based upon origin. The Alchien-Allen theorem states that if substitutable goods of differing quality have a fixed transportation cost, the higher quality item will be relatively cheaper after transport than before. According to this theory, slaves with highly valued characteristics would be more likely to be shipped from farther away regions. The authors found no support for this theory in their data. As a result, the data used in this paper - Fogel and Engerman's probate records and newspaper advertisements - should be considered as closer to a random sample rather than being censored or biased towards more or less productive slaves.[23]

4 Identification and Main Empirical Estimates

Using the data described in Section 3, a difference-in-difference approach is used to determine how the risk of slave escape contributed to regional slave price differences. The strategy relies on the Fugitive Slave Act of 1850 impacting states closer to the pro-abolition North differently to those in the Deep South. The question central to this paper is, given the distribution of slaves between the Upper and Deep South in 1850, and the change in public monitoring brought about by the Fugitive Slave Act, does the price gap between the regions *actually* fall? If so, then it is evidence that concerns about slave escape contributed significantly to the observed regional price

[23]Other sources of sample selection bias will be discussed in Section 4.

differences. If not, it is evidence that varying risks of escape were not a determinant of the gap in prices between the regions. A more substantive model of the market for slaves, detailing the existing equilibrium and how it is disturbed by the Fugitive Slave Act, is presented in this paper's Appendix.

Identification of the treatment effect (the effect of the Fugitive Slave Act) using a difference-in-difference approach requires the assumption that there would be a parallel trend across the South in the absence of the Fugitive Slave Act. However, the assumption of parallel trends may be incorrect in this application. Instead, it was quite likely that slave prices in the states closer to the North would have diminished relative to those in the South in the years after the 1850 Act. Changing attitudes towards slavery combined with manumission and abolition movements would have made the slave trade less attractive in areas closer to Philadelphia compared to New Orleans. While the assumption of parallel trends may be violated, the alternative expected trend would bias estimates towards zero, working against finding any significant effects of the Act. As prices in the Upper South might be expected to fall (relative to the Deep South) in the absence of the Act estimates can therefore be considered as a lower bound. The estimating equation is of the form;

$$slave\ price = \beta_0 + \Pi X + \beta_1 D_1(1 = after\ 1850) + \beta_2 D_2(1 = Upper\ South)$$
$$+ \delta D_3(1 = after\ 1850 \times Upper\ South) + \epsilon$$

In this specification, Π is a vector of coefficients $\pi_1, ..., \pi_n$ corresponding to the effect of individual characteristics $x_1, ..., x_n \in X$. The difference-in-difference estimator $\hat{\delta}$ represents the differential effect of the Fugitive Slave act on slave prices in states close to the Mason-Dixon line relative to the Deep South. Table 3 presents OLS estimates which use the log and dollar price of a slave as the dependent variable in alternate columns. Columns 3 and 4 omit the "sale" price substitutions mentioned in Section 4.[24] As can be seen, their omission or inclusion has some effects, particularly on the difference-in-difference estimator. In the estimation presented, data is limited to 4 years either side of Fugitive Slave Act. The four years before January 1, 1850 are considered as

[24]To remind the reader, these were slaves who had a sale price reported in the data instead of an appraisal.

pre-treatment and the four years from January 1, 1850 to December 31, 1853 as post-treatment.[25]

Table 3: OLS Diff-in-Diff Estimates for Full 1846-1853 Sample (Males and Females 10 and older)

	(1) Log of Slave Price	(2) Appraised Slave Price	(3) Log of Slave Price *excl. Sale Prices*	(4) Appraised Slave Price *excl. Sale Prices*
Male	0.290***	148.7***	0.285***	140.8***
	(0.01)	(3.97)	(0.01)	(3.81)
Age	0.0692***	22.21***	0.0696***	22.41***
	(0.00)	(1.20)	(0.00)	(1.16)
Age Squared	-0.00129***	-0.395***	-0.00129***	-0.394***
	(0.00)	(0.02)	(0.00)	(0.02)
Upper South	-0.501***	-188.6***	-0.535***	-196.0***
	(0.02)	(5.62)	(0.03)	(5.74)
After Fugitive Slave Act (FSA)	0.223***	131.9***	0.208***	119.1***
	(0.01)	(4.67)	(0.01)	(4.33)
Upper South x After FSA	0.254***	69.31***	0.312***	93.61***
	(0.03)	(8.93)	(0.03)	(9.07)
Observations	9,579	9,579	8,681	8,681

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

The estimates in Table 3 indicate that the effect of the Fugitive Slave Act on slave prices in the Upper South was positive and both statistically and economically significant. The first column of the table reports the difference-in-difference OLS estimates using the log of slave price. The column suggests prices were 50.1% lower in the Upper South across the period with a 22.3% rise after the law was enacted. The difference-in-difference coefficient of interest (Upper South x After Fugitive Slave Act) corresponds to a 25.4% *additional* price increase in the Upper South compared to the Deep South after the Act.[26] The second column of Table 4 uses the level of the dependent variable (in dollars) and suggests that prices in the Upper South were $188.60 lower than in the Deep South once age and sex were taken into account. After the Fugitive Slave Act, prices rose (everywhere) by an average of $131.90 but by an *additional* $69.31 in the Upper South - eliminating a significant proportion of the $188.60 price gap between the regions.[27]

Against the backdrop of declining support for slavery in all Northern states and the relatively

[25]The new law did not come into effect until September of 1850. Considering the treatment date to be from January 1st 1850 onwards allows for anticipated effects to preempt the law. Moving the "treatment" date to 1851 (as the data is not stratified by month) will be a robustness check on the data.

[26]Coefficients in a log-linear model indicate that for a unit change in the independent variable there is a $100 * \beta\%$ change in the dependent variable.

[27]Using the dollar price of slaves estimates in a higher relative interaction effect. This is not surprising as the log specification tightens the distribution of prices and diminishes the impact of larger values.

quick responses to the Act that Northern states set in motion - such as new personal liberty laws - the estimates presented can only be considered a lower bound on how the threat of slave escape impacted regional variation in slave prices. Moreover, as the law only *reduced* the chance of successful escape rather than *eliminating* it, the risk of escape could even have driven a majority of the gap in regional prices.[28] Table 4 presents similar estimations separately for Males and Females. Estimating the effect separately for males and females shows the Act's effects were not limited to either gender but perhaps slightly higher for females.

Table 4: OLS Diff-in-Diff Estimates for Males and Females Separately

	Males		Females	
	(1)	(2)	(3)	(4)
	Log of Slave Price	Appraised Slave Price	Log of Slave Price	Appraised Slave Price
Age	0.0790***	30.10***	0.0574***	11.86***
	(0.00)	(1.88)	(0.00)	(1.38)
Age Squared	-0.00136***	-0.495***	-0.00122***	-0.263***
	(0.00)	(0.03)	(0.00)	(0.02)
Upper South	-0.448***	-191.0***	-0.558***	-179.7***
	(0.03)	(8.08)	(0.04)	(7.29)
After Fugitive Slave Act (FSA)	0.229***	149.5***	0.221***	107.9***
	(0.01)	(6.67)	(0.02)	(5.91)
Upper South x After FSA	0.232***	63.93***	0.276***	76.21***
	(0.04)	(12.32)	(0.05)	(12.10)
Observations	5,579	5,579	4,000	4,000

Columns 1 and 2 show estimates based on males-only. Columns 3 and 4 restrict the sample to females-only.
*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

The estimates in Tables 3 and 4 indicate that the effect of the Fugitive Slave Act, a piece of legislation designed to restrict the ability of slaves to escape to freedom, impacted the regions of the South in different ways. In particular, in states who were close to the Mason-Dixon line, the Act increased the appraised value of slaves whose owner passed away, a sample more likely to be representative of the slave population than potentially censored auction sales. The increase in price after the Act removed a significant proportion of the gap in slave prices between Southern regions providing evidence that slave escape contributed significantly to regional price differences in the antebellum South.

[28] That is, the Act could affect prices via two channels. One, slave-owner property rights were strengthened. Two, the reduced threat of escape could impact how hard a slave was worked.

4.1 Composition Bias

One major concern with the estimations in Table 3 and 4 is a bias that may be introduced by the aggregation of states in the two regions. In particular, the Upper South is defined as consisting of three states - Maryland, Virginia, and North Carolina - while the Deep South consists of five states - Georgia, Louisiana, Mississippi, Tennessee, and South Carolina. Table 2 (earlier) shows that different states had different prices and a composition bias could be driving the results if the data contains more observations from higher-priced states in the Upper South (or more lower priced in the Deep South) after 1850. Table 5 splits the eight-year 1846-1853 period into two four-year windows (1846-1849 and 1850-1853) and details the number of observations and the average price of a slave in each state in each period. It also provides weighted average prices for the regions based on the relative frequency of observations from a state in a given region. In the table it is easy to see that the data suffers from composition problems in the Upper South moreso than in the Deep South. In particular, while the total number of observations in each time period for each region is stable there are more observations from North Carolina and Virginia post-1850 relative to pre-1850. Because these states have higher prices before 1850, the fact that there are more of them in the sample after 1850 means that the average price in the Upper South would be *mechanically* higher post-1850. Ultimately, this means that the estimates provided in Tables 3 and 4 are biased upwards as they are the joint effects of the law and a change in sample composition. For example, recalculating the average post-1850 price in the Upper South using the pre-1850 frequency weights would give an average price of just $505.79 rather than $545.57 as observed.

Table 5: Prices and Relative Frequency by State before and after 1850

State	1846-1849	Observations	Rel. Freq	1850-1853	Observations	Rel. Freq
North Carolina	$ 419.19	45	8%	$ 644.51	230	29%
Maryland	$ 301.78	434	73%	$ 480.53	356	45%
Virgina	$ 391.19	113	19%	$ 547.56	199	25%
Upper South Total	$ 327.77	592	100%	$ 545.57	785	100%
South Carolina	$ 436.50	118	3%	$ 575.17	347	8%
Louisiana	$ 542.98	2747	71%	$ 666.43	2732	63%
Tennessee	$ 453.12	16	0%	$ 731.43	14	0%
Georgia	$ 478.29	334	9%	$ 615.35	526	12%
Mississippi	$ 540.07	679	17%	$ 702.69	689	16%
Deep South Total	$ 533.33	3894	100%	$ 658.85	4308	100%

Note: Regional price is the weighted average price.

While there are changes in the composition of the sample, the effect of that law is still large and significant post-1850. For example, looking just at Maryland, the increase in the average price between the two periods is over $180 (a 60% increase compared to the 1846-1849 price). Also, as mentioned earlier, many would not consider North Carolina as part of the Upper South. Indeed, some parts of North Carolina (particularly the important trading port of Wilmington and its environs) are *further* from the Mason-Dixon line than large parts of Tennessee and South Carolina. In addition, North Carolina prices are similar to South Carolina and Tennessee before 1850 and are *higher* than South Carolina after 1850. Moreover, North Carolina has just 45 observations before the law. The fact that North Carolina has so few observations leaves a concern that the 1846-1849 average price of $419.19 may be an underestimation (or at least lack accuracy).[29] When combined with a concern that North Carolina slaves may face escape probabilities more similar to South Carolina and Tennessee this suggests an alternate specification removing North Carolina from the analysis would be worth examining. The first column of Table 6 shows that the effects of the law (the co-efficient on the difference-in-difference term) are actually enhanced by the removal of the problematic North Carolina observations. The estimates of the Act's additional impact on Upper South prices increase to 28.2% and over $82. The reason for this is that the inclusion of North Carolina as an Upper South state reduced the overall price difference between the areas across

[29]The same could be said of Tennessee but there are so few observation before and after 1850 that estimates are completely unchanged by its exclusion or inclusion.

the sampe period. As a result, dropping North Carolina ensures the effects of the law become even more pronounced. Table 6 also illustrates the effects of removing Virginia so that Maryland is the *only* state considered as "Upper South." This specification completely eliminates composition effects as a potential driver of the increases in Upper South prices seen in Table 3 and 4. Additionally, Table 7 examines how the inclusion of state-level fixed effects alters the estimated co-efficients. This removes the binary indicator for "Upper South" in the analysis, instead inserting a binary indicator for each state. The fixed-effect allows for the difference in each state's average prices to be accounted for. The broad story told in Table 7 is consistent with the overall picture although the difference-in-difference co-efficient is smaller in economic significance even if it remains highly statistically significant.

Table 6: OLS Diff-in-Diff Estimates under a Series of Sample and Specification Restrictions

	Excluding NC		**Excluding NC and VA**	
	(1)	(2)	(3)	(4)
	Log of Slave Price	Appraised Slave Price	Log of Slave Price	Appraised Slave Price
Male	0.291***	149.3***	0.291***	150.6***
	(0.01)	(4.09)	(0.01)	(4.18)
Age	0.0687***	22.10***	0.0689***	22.19***
	(0.00)	(1.23)	(0.00)	(1.25)
Age Squared	-0.00128***	-0.393***	-0.00128***	-0.393***
	(0.00)	(0.02)	(0.00)	(0.02)
Upper South	-0.540***	-202.5***	-0.594***	-213.4***
	(0.03)	(5.80)	(0.03)	(6.28)
After Fugitive Slave Act (FSA)	0.223***	131.8***	0.223***	131.7***
	(0.01)	(4.67)	(0.01)	(4.67)
Upper South x After FSA	0.282***	82.64***	0.324***	95.20***
	(0.03)	(9.95)	(0.04)	(11.30)
Observations	9,114	9,114	8,802	8,802

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

Table 7: OLS Diff-in-Diff Estimates with State-level Fixed Effects

	State FEs	
	(1)	(2)
	Log of Slave Price	Appraised Slave Price
Male	0.290***	148.6***
	(0.01)	(3.93)
Age	0.0689***	22.08***
	(0.00)	(1.19)
Age Squared	-0.00129***	-0.393***
	(0.00)	(0.02)
After Fugitive Slave Act (FSA)	0.226***	134.0***
	(0.01)	(4.69)
Upper South x After FSA	0.164***	38.57***
	(0.03)	(9.24)
Observations	9,579	9,579

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

4.2 Reverse Experiment

A consequence of the fugitive slave act was that Northern states moved to enact enhanced "Personal Liberty" laws that were designed to undermine the Fugitive Slave Act. Johnson and Deyle suggest that these laws were implemented around 1854 but their timing varied across states. The enactment of these laws allow for a second examination of the impact of a regulatory change which alters the likelihood of successful escape. The only difference in 1854 is that the laws enacted in Free states made successful slave escape *more* likely. In that sense, if the chance of escape truly affects prices, the 1854 personal liberty laws should undo some or all of the price increases observed in the Upper South in response to the 1850 Fugitive Slave Act. Focusing on the period from 1852 to 1857, and treating 1854 as the treatment date, the effect of these enhanced personal liberty laws are presented in Table 8.

The negative coefficient on the interaction term between the Upper South and post-1854 suggests the personal liberty laws had the expected effect albeit somewhat smaller in absolute magnitude and measured with less precision than the effect of the Fugitive Slave Act. This lack of precision manifests itself as highly significant effects when the dependent variable is in dollars but a lack of significance in the log specification. The imprecision is perhaps not surprising as

Table 8: OLS Diff-in-Diff Estimates for the Period 1852-1856 (Males and Females)

			State FEs	
	(1)	(2)	(3)	(4)
	Log of Slave Price	Appraised Slave Price	Log of Slave Price	Appraised Slave Price
Male	-0.0341	95.08***	0.273***	185.1***
	(0.03)	(13.10)	(0.01)	(5.29)
Age	0.0620***	25.31***	0.0672***	26.77***
	(0.00)	(1.27)	(0.00)	(1.29)
Age Squared	-0.00128***	-0.500***	-0.00127***	-0.497***
	(0.00)	(0.02)	(0.00)	(0.02)
Upper South	-0.198***	-101.4***		
	(0.02)	(8.53)		
After 1854	0.160***	135.6***	0.141***	124.7***
	(0.01)	(6.44)	(0.01)	(6.47)
Upper South * After 1854	-0.0226	-62.24***	-0.0542**	-66.75***
	(0.03)	(11.78)	(0.03)	(12.33)
Observations	8,189	8,189	8,189	8,189

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

the new personal liberty laws *varied* in their timing and content across Free states. The difference between the estimates using the log and absolute (dollar) value highlights that there are also data issues with changes in the composition of the sample before and after the law. Accounting for these using state-level fixed effects (to again net out the effect of a changing composition of states with different average prices in the sample) gives the estimates in columns 3 and 4. This restores statistical significance in the log specification but the overall effect of the re-instituted personal liberty laws is still small. While $62-$66 is not trivial, the average price of a slave by the mid-1850s was above $740 in the sample. While the "reverse experiment" suffers from composition problems *and* variation in the exact timing of new laws in the Free States, it is clear that laws which made slave escape harder and then easier had predictable effects on prices: effects that have been largely ignored in the literature to date.

5 Additional Robustness Checks

5.1 Narrower and Wider Event Windows

The estimates presented in Section 4 were unaffected when the sample was restricted to just males or just females. In addition, allowing for a wider, 10-year window (1845-1854) does not

change the magnitude of estimate by much but tightens confidence intervals due to additional data points. A very narrow 4-year window (1849-1852) reduces the size of the estimated effect relative to the preferred eight-year window in section 4. Table 8 reports the estimates from these the narrower and tighter windows, repeating the difference-in-difference estimation as laid out in Section 4. The effect on slave prices in the Upper South using the narrower time period are presented in Panel A. Focusing on log prices, the estimated effect of the law falls to close to a 22% increase attributable to the law. Taking a wider time period, Panel B estimates a similar increase. Columns 3 and 4 of each panel include state fixed-effects to ease concerns about the changing composition of the sample across time. These indicators for each state reduce the size and significance of the estimates, particularly in the narrow window where so few valid observations occur in the Upper South (of the 4,905 observations, fewer than 1-in-7 are observed in the Upper South in the narrow four year window).

Table 9: Robustness to Event "Window" Changes

Panel A - narrow window (1849-1852)

	(1) Log of Slave Price	(2) Appraised Slave Price	(3) Log of Slave Price	(4) Appraised Slave Price
Male	0.284***	137.8***	0.285***	138.0***
	(0.01)	(5.13)	(0.01)	(5.06)
Age	0.0659***	20.24***	0.0653***	19.98***
	(0.00)	(1.53)	(0.00)	(1.51)
Age Squared	-0.00125***	-0.362***	-0.00124***	-0.358***
	(0.00)	(0.02)	(0.00)	(0.02)
Upper South	-0.504***	-192.5***	*State FEs*	*State FEs*
	(0.03)	(7.61)		
After FSA	0.144***	86.64***	0.145***	86.97***
	(0.02)	(6.21)	(0.02)	(6.20)
Upper South x After FSA	0.216***	47.23***	0.0853**	1.713
	(0.04)	(11.17)	(0.04)	(11.22)
Observations	4,905	4,905	4,905	4,905

Panel B - wider window (1845-1854)

	(1) Log of Slave Price	(2) Appraised Slave Price	(3) Log of Slave Price	(4) Appraised Slave Price
Male	0.286***	147.2***	0.287***	147.5***
	(0.01)	(3.62)	(0.01)	(3.57)
Age	0.0681***	21.80***	0.0679***	21.69***
	(0.00)	(1.06)	(0.00)	(1.05)
Age Squared	-0.00129***	-0.393***	-0.00128***	-0.391***
	(0.00)	(0.02)	(0.00)	(0.02)
Upper South	-0.455***	-177.8***	*State FEs*	*State FEs*
	(0.02)	(4.68)		
After FSA	0.294***	167.0***	0.294***	167.8***
	(0.01)	(4.33)	(0.01)	(4.34)
Upper South x After FSA	0.220***	59.72***	0.130***	24.31***
	(0.02)	(8.02)	(0.03)	(8.42)
Observations	11,986	11,986	11,986	11,986

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

5.2 Sensitivity to the Implementation Date

September 1850 was the official implementation date of the Act. However, in Section 4 the Act was considered as affecting all observations after *and* including 1850. This decision was in order

to allow for the Act to have anticipated effects. Unfortunately, the data cannot be stratified into any finer time periods than "year of appraisal" and treating the date the law comes into effect as 1850 potentially overestimates any effect while treating it as 1851 would underestimate it. This is because each choice results in either a number of slaves appraised in 1850 being classified as pre-treatment when they were actually appraised after the new laws or as post-treatment when they were actually appraised before the law was enacted. Table 10 reports the estimates from the same 1846-1853 time period but considers observations occuring in 1850 as before the Act rather than after. The table shows changing the treatment date to 1851 reduces the magnitude of the empirical effect of the Fugitive Slave Act to 21.5% in the log specification. In addition, dropping 1850 completely leaves the results broadly unchanged. Overall, Table 9 highlights that the exact implementation date of the law was less important than the difference it caused between the periods 1846-49 and 1851-53. Again, columns 3 and 4 report estimates using state-level fixed-effects to net out the effects of a changing sample composition.

Table 10: OLS Diff-in-Diff Estimates using 1851 as "Treatment" Date

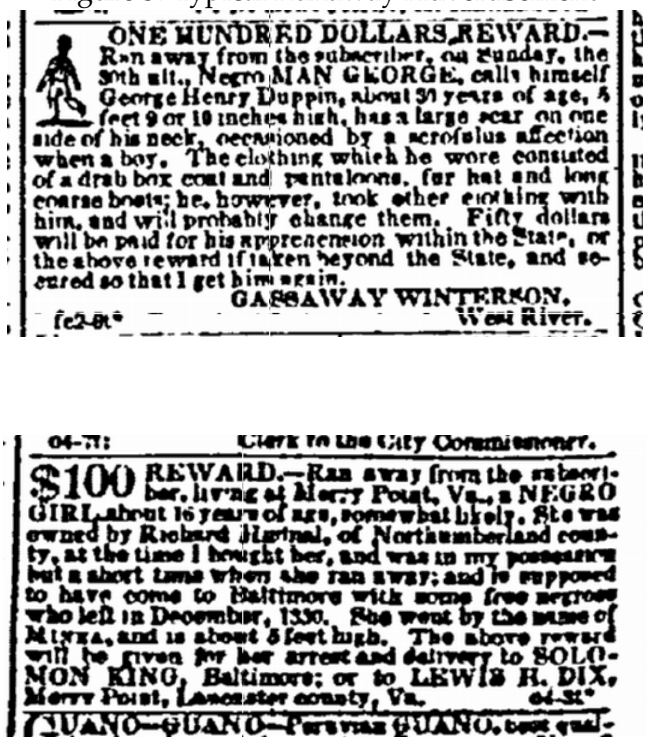
	(1)	(2)	(3)	(4)
	Log of Slave Price	Appraised Slave Price	Log of Slave Price	Appraised Slave Price
Male	0.293***	150.2***	0.293***	150.0***
	(0.01)	(3.97)	(0.01)	(3.93)
Age	0.0695***	22.32***	0.0691***	22.16***
	(0.00)	(1.21)	(0.00)	(1.20)
Age Squared	-0.00129***	-0.396***	-0.00129***	-0.393***
	(0.00)	(0.02)	(0.00)	(0.02)
Upper South	-0.438***	-173.4***	*State FEs*	*State FEs*
	(0.02)	(5.40)		
After FSA	0.225***	131.0***	0.227***	132.9***
	(0.01)	(5.11)	(0.01)	(5.12)
Upper South x After FSA	0.215***	68.29***	0.129***	42.54***
	(0.03)	(9.73)	(0.03)	(9.92)
Observations	9,579	9,579	9,579	9,579

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

5.3 Additional Evidence

Runaway slaves were often advertised in local newspapers and the frequency of unique (and repeated) advertisements along with information on rewards can provide another source of evi-

Figure 3: Typical Runaway Advertisement



ONE HUNDRED DOLLARS REWARD.—Ran away from the subscriber, on Sunday, the 30th ult., Negro MAN GEORGE, calls himself George Henry Duppin, about 30 years of age, 5 feet 9 or 10 inches high, has a large scar on one side of his neck, occasioned by a scrofulus affection when a boy. The clothing which he wore consisted of a drab box coat and pantaloons, fur hat and long coarse boots; he, however, took other clothing with him, and will probably change them. Fifty dollars will be paid for his apprehension within the State, or the above reward if taken beyond the State, and secured so that I get him again.

GASSAWAY WINTERSON,
West River.

fe2-6t*

04-7t: Clerk to the City Commissioner.

$100 REWARD.—Ran away from the subscriber, living at Merry Point, Va., a NEGRO GIRL, about 16 years of age, somewhat likely. She was owned by Richard Hartsal, of Northumberland county, at the time I bought her, and was in my possession but a short time when she ran away; and is supposed to have come to Baltimore with some free negroes who left in December, 1850. She went by the name of Minna, and is about 5 feet high. The above reward will be given for her arrest and delivery to SOLOMON KING, Baltimore; or to LEWIS R. DIX, Merry Point, Lancaster county, Va. 04-3t*

GUANO—GUANO—Peruvian GUANO, best qual-

Source: America's Historical Newspapers. Available with subscription from readex.com

dence on the Fugitive Slave Act's effects. Newsbank's American Newspaper Archives provides digitized editions of historical daily newspapers from across the U.S, search-able by keyword.[30] The advertisements typically provide a description of the slave, perhaps record the county from which the slave fled, detail the name of the slave owner, and give a dollar value and the terms of the reward offered for the capture of the runaway. Typical examples are provided in Figure 6.

The advertisements provide another source of data that can be used to examine the central thesis of this paper: was slave escape an important economic aspect of the institution of slavery? While the advertisements do not report sale prices, the reward offered in the advertisements can help assure us that the findings presented in Section 4 and 5 are actually driven by stronger property rights for slave-owners in the Upper South. To collect the advertisements data, a search is completed of Newsbank's America's Historical Newspapers for all advertisements containing the words "abscond*", "runaway*", "ran away*", "run away*", or "apprehen*" for the period 1849-

[30] Available with subscription via readex.com.

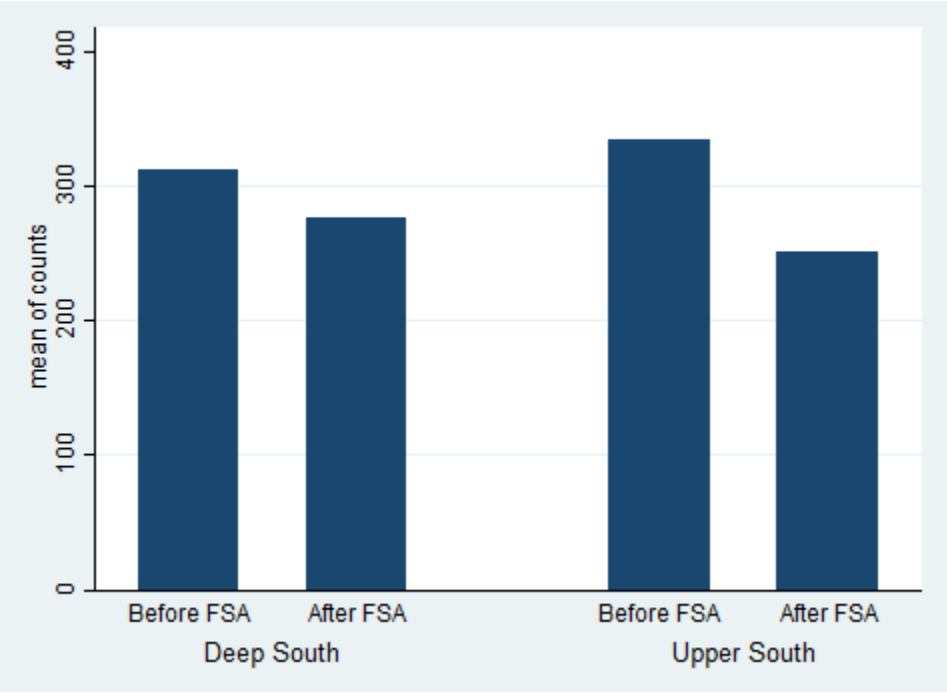
1852. The search returns thousands of results from dozens of newspapers printed in slave states. Due to both the number of records to be codified and the less-than-perfect quality of the digital images (see Figure 6), gathering this data is an arduous process. To simplify data collection, only results from four states (Louisiana, Georgia, Maryland, and Virginia) are examined. This reduces the number of results to about 12,000. As not all of these turn out to be actual advertisements for runaways the data-set eventually contains just over 6,000 observations.[31] In addition, many turn out to be repeated advertisements for the same escapee. The number of repeated notices is recorded and can be used to crudely examine how "quickly" slaves were recaptured. Of the remaining unique observations some were illegible or were missing crucial information such as the slave's age, sex, or details of a monetary reward. In the valid sample, there are just under 1,000 unique observations.

The effect the Act would have on the actual number of attempted runaways and, by extension, advertisements, is not predictable. For buyers and sellers of slaves the strengthening of property rights would increase buyers' willingness to pay, reduce sellers' incentives to sell, and push up market prices in the Upper South. However, if slave-owners then treat their slaves worse because they were assured that the slave would be returned even if they tried to escape, it might make sense if *more* slaves tried to run away. On the other hand, if slaves were aware of the law's effects, they may be *less* motivated to try to escape as they are less likely to succeed. Ultimately, this means the actual number of advertisements recorded in each area before and after the Act, presented in Figure 4, tell us little of interest.

On the other hand, if the results using Fogel and Engerman's probate data are explained by stronger property rights then rewards offered for similar slaves in the Upper South should fall (relative to the Deep South) after the Act comes into effect. This effect should be expected regardless of the actual *number* of advertisements observed. If rewards do not fall, it suggests that prices in the Upper South were increasing for reasons unrelated to slave-owner property rights and would suggest the Fugitive Slave Act was unnecessary and irrelevant. On the other hand, if rewards offered fall even though we know prices are rising then it is strong additional evidence that the Fugitive Slave Act represented a significant strengthening of slave-owners property rights. Fur-

[31] In fact, given the search terms, the reader may have guessed that quite a few of the false positive search results are notices regarding lost dogs.

Figure 4: Frequency of Advertisements for Two Years Before and After the Fugitive Slave Act (FSA) by Region



Source: Data gathered by the author from advertisements provided by Newsbank's American Historical Newspapers collection. Data available with subscription to readex.com.

ther, it would provide more evidence to suggest escape was a fundamental part of the institution of slavery and a significant determinant of regional price variation.

Table 11 below provides summary statistics from the advertisements data by state and year. It can be seen that advertisements for runaways were most often for male slaves and were generally in their mid to late twenties. The small number of observations (1852 had no valid observations) from Georgia ensures noisy summary statistics.[32] However, even in states with more observed advertisements the summary statistics are quite noisy.

[32]There were no valid observations for Georgia in 1852. There were a number of advertisements in that year but they were for a slave under 12 or were missing gender, age, or specific details of a reward.

Table 11: Summary Statistics: Advertisements Data

	Male	Age	$ Reward Offered	# of Repeats	# of Observations
Georgia					
1849	92%	29.6	65.56	5.1	12
1850	80%	23.5	16.43	1.7	10
1851	71%	25.4	17.14	3.0	7
1852					
Louisiana					
1849	78%	24.8	31.6	5.0	165
1850	68%	26.5	33.45	5.5	77
1851	70%	28.4	60.59	11.2	99
1852	68%	27.0	35.9	11.1	130
Maryland					
1849	82%	23.7	70.99	2.8	101
1850	80%	22.2	85.99	2.8	115
1851	83%	23.6	83.84	3.2	71
1852	81%	20.3	53.07	3.7	103
Virginia					
1849	88%	27.9	27.88	2.6	26
1850	77%	25.7	39.33	2.5	31
1851	95%	35.1	36.9	3.9	21
1852	95%	26.3	44.25	2.2	20

Data collected by the author from advertisements for runaways found by searching through Newsbank's digitized repository of American Newspapers (available with subscription at readex.com). The table presents summary statistics for each state and year for percent male, mean age, mean reward offered and number of times the advertisement was repeated. The data is restricted to valid observations which were those listing a monetary reward, the gender of the slave, and were for a slave who was at least 12 years old. Note that 1852 contained no observations for Georgia.

Estimates generated from the collected data, using the same difference-in-differences approach as earlier, suggest rewards offered in the Upper South drop dramatically after the Act. Table 12 provides the OLS regression estimates using the 931 valid observations. The coefficient on the difference-in-differences estimator in the second column shows that after the Act, rewards in the Upper South fell by $19.08 relative to advertised rewards in the Deep South. In the first column, the dependent variable has been logged to allow the coefficient to be interpreted as a percentage change. It suggests rewards fell by 21.3% in the Upper South relative to the Deep South after the Fugitive Slave Act came into place. The sign of the estimate is consistent with improved property rights for slave-owners. What makes the estimates in Table 12 even more striking is that the

rewards offered for runaways *fall* relative to the Deep South while market prices for slaves in the area were rising.

Table 12: OLS Diff-in-Diff Estimates of Changes in Rewards Offered using Advertisements Data

	(1) Log Reward	(2) Reward	(3) # of Repeated Advertisements
Upper South	0.569	37.94*	-2.185***
	(0.248)	(15.05)	(0.325)
After FSA	0.200**	13.21**	5.751***
	(0.0389)	(2.464)	(0.154)
Upper South x After FSA	-0.213**	-19.08**	-5.090***
	(0.0566)	(3.727)	(0.187)
Observations	929	929	988
Controls for Age	Y	Y	Y
Controls for Sex	Y	Y	Y

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Again, however, the concern with this approach and the estimates presented are issues of selection and composition bias. Easing concerns about composition bias, the sample includes all available advertisements in the states of Lousiana, Georgia, Maryland, and Virginia from 1849-1852. At the same time, there are fewer observations for Maryland in 1851 relative to earlier years and as rewards are lower there anyways (see Table 11), this could be driving the effects observed. However, the change in composition is small enough and the difference in prices between between states within the Upper and Deep South category that spatial composition effects do not seem to be driving the findings. In particular, re-running the estimation in Table 12 with the addition of state fixed-effects leaves the estimates virtually unchanged in the dollar specification. At the same time, the log specification remains close to a 20% fall in rewards offered but, partly due to the small sample size, fails to reach standard measures of statistical significance. See Table 13 below for more details.

Table 13: OLS Diff-in-Diff Estimates of Changes in Rewards Offered using Advertisements Data:Adding State Fixed-Effects

	(1) Log Reward	(2) Reward	(3) # of Repeated Advertisements
After FSA	0.187**	12.57**	5.567***
	(0.0755)	(5.212)	(1.083)
Upper South * After FSA	-0.209	-19.03**	-4.919***
	(0.128)	(7.752)	(1.139)
Observations	929	929	988
Controls for Age	Y	Y	Y
Controls for Sex	Y	Y	Y

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Aside from composition bias, the data collected could still be biased or censored by the decisions of slave-owners as the passing of the Act may have changed the incentive to advertise runaways or eliminated the need to advertise at all. However, such censoring *could* be expected to work against finding any empirically significant results. This is because the decision to incur the cost to advertise should be positively related to the value of the slave. For the estimates in Table 12 to represent the consequences of censoring or selection, the opposite would have to be happening: Slave-owners in the Upper South would have to react to the law by deciding to only advertise in the event of escape of a "lower value" slave. Alternatively, perhaps the data *before* the Act was left-censored and slave-owners did not advertise if lower value slaves escaped but began to do so after the Act. As age and sex were strong predictors of price, Table 14 might help shed some light on both types of censoring issues. In Table 14, the *Age* columns report the mean age of runaways for the Upper and Deep South before and after the Act. It appears that advertisements tended to be for older slaves in both regions after the Act. This would actually be expected to increase rewards offered all else equal (slave prices increased with age up to a point). However, only the difference in age in the Deep South is statistically different from zero. The proportion of males in the sample increases in the Upper South after the Act but not significantly. At the same time, there is a decrease in the proportion of males in the sample in the Deep South after the law passed. Together, this means that, after the Act, there are no statistically significant changes in the

age or sex of advertised slaves in the Upper South. In the Deep South, advertisements tended to feature older slaves but more females. The differences are statistically significant but would have contradictory impacts on the rewards offered. Observing advertisements for older slaves suggests selection may be biased towards higher value slaves but observing more advertisements for females suggests the opposite.[33] Because of the lack of significance in the Upper South and contradictory changes in the Deep South Table 14 should help reduce concerns about how censoring and selection could bias estimates.[34]

Table 14: Mean *Age* and Percent *Male* Runaways from Advertisements Data

	Age (years)		***Percent Male***	
	Before FSA	After FSA	Before FSA	After FSA
Upper South	23.76	25.23	82.35%	86.84%
t-stat under $H_0 : before = after$	-1.32 (n=238)		$-.9455$ (n=233)	
Deep South	25.05	27.89	74.88%	62.02%
t-stat under $H_0 : before = after$	-3.41 (n=331)		2.49 (n=328)	

Note that the number of observations for each test in each region differs slightly due to differences in missing values. The t-stat reported represents a simple comparison of means test under the null of no difference. The t-statistic and number of observations used for the test is reported. In all four tests, the alternative hypothesis is that the means are indeed different.

In addition to the information gleaned from the rewards offered for runaways, the number of times an advertisement is repeated can give a crude but still valuable estimate of how long it may have taken to recover a runaway. If the Act had bite, we would expect the number of re-advertisements for the same slave to fall. Column 3 of Table 12 presents OLS results again using a difference in difference approach but where the dependent variable is the number of times a runaway advertisement was repeated for the *same* slave. An advertisement is considered as a re-run if the advertisement appears in the same newspaper for a slave with the same owner, gender,

[33]Before the Act, the data suggest a 25 year old and 28 year old slave would have mean rewards of \$37.89 and \$40.32. After the Act, these values change only slightly to \$37.80 and \$40.24. Similarly, a male slave would have a reward approximately \$2 higher on average than a female slave. These values are produced using the estimated coefficients from the regression in Table 10.

[34]Despite the usefulness of Table 14 in helping us understand the changes in the demographics of advertised runaways and how it relates to rewards, the table cannot ease concerns about how selection would affect an analysis of the *number* of advertisements in each region and time period. This is because the decision to advertise is a function of two factors - the likelihood of recapture and the market value of the slave. As the Fugitive Slave Act affected these in the same direction it is not clear what we should expect slave-owners to do in the event of an escaped slave. It is much easier to examine rewards offered. Conditional on advertising, the increase in likelihood of recapture pushes rewards down while the increased value pushes rewards up. As we know that slave values go up after the law (from Section 5) then a fall in rewards offered is strong evidence that the Act had a significant impact on the likelihood of slave escape.

age, and offered reward. The difference-in-difference estimate (the coefficient on *Upper South * After FSA*), comparing the simple frequency of re-runs before and after the law in the Upper and Deep South, suggests a fall in the number of times a newspaper advertisement re-appeared in the Upper South after the Act relative to the Deep South. The significant reduction in the number of times an advertisement was ran in the Upper South after the Act is further evidence that the Act made it easier to recapture escapees, enhanced border state slave-owners' property rights, and was far from a perfunctory Congressional nod to Southern interests.

5.4 The Effect of the Act on the Sale Price of Slaves Transported South

One further way in which to examine the impact of the Act would be to look at how the Act affected the price of slaves who were removed to the South. A straightforward analysis of the prices commanded by slaves from the Upper South compared to those who were sold by local slave-owners in the Deep South would help determine if the Act raised Upper South slave prices. Examining the New Orleans notarized slave sale data (Fogel and Engerman's Notarized Slave Sale Sample, 2008) used by Choo and Eid, Greenwald and Glassspiegel, and Kotlikoff is the most immediate way to complete such an empirical exercise. The data-set contains slave sale prices, demographic details, and place of origin for slaves sold in New Orleans from 1804-1862. However, the data-set is limited to just over 5,000 notarized slave sales across those 50 years, an average of slightly more than 100 randomly chosen observations per year.[35] This data set is ideal for long term examinations of the determination of slave prices but is perhaps of limited use when focused on a small window around 1850.

Comparing slaves *from* the Upper south to New Orleans locals rather than slaves *in* the Upper South, estimates suggest that slaves coming from the Upper South tended to sell for about $90 more after the Fugitive Slave Act relative to their local brethren. However, the estimates are statistically insignificant and are not robust to small changes in sample selection or empirical specification. Because of the limited sample size and the noisiness of these estimates, they are not presented here.[36]

[35] In fact, Fogel and Engerman randomly transcribed 2.5% or 5% of the available data in each year so some years have 200 or more observations while others have less than 100.

[36] This noisiness of the results using the New Orleans Notary Sales data is not surprising: After eliminating children, "group" sales, and those from unknown locations, the estimation relies on only 371 observations around 1850. Of these,

6 Conclusion

The cause of the regional gap in antebellum slave prices has generally been attributed to differences in slave productivity across regions. Only scattered contributions by Freehling and Hummel and Weingast have suggested slave escape as a potential complimentary factor. Moreover, neither paper provides strong empirical evidence to back their claims. This paper uses existing data on slave prices from probate appraisals plus a unique data-set of newspaper advertisements for escaped slaves to examine the issue of escape in detail. As the likelihood of successful slave escape varied by region, the Fugitive Slave Act of 1850 can be exploited as a natural experiment to examine how escape affected slave prices. The fact that slaves and their owners in the states closer to the pro-abolition North were affected by the Act differently to those in the Deep South lends itself well to a difference-in-difference approach to estimation. In the main estimates, the four years before January 1, 1850 were considered as before the Act and the four years from January 1, 1850 to December 31, 1853 are after.[37] After the Act, the gap in regional slave prices falls considerably. The main empirical findings are supported by evidence from both a reverse natural experiment and data from newspaper advertisements for runaways. The reverse experiment shows that when Free states enacted laws to undermine the Fugitive Slave Act, price increases seen in the Upper South due to stronger property rights were partially reversed. The findings are also robust to alternate treatment dates and to the inclusion and exclusion of more time periods.

Data from newspaper advertisements for runaways provide corroborating evidence that the Fugitive Slave Act had an impact on the institution of slavery, particularly in the Upper South where slave-owner property rights were eroded by Northern states' personal liberty laws. This data is invaluable as a check against alternate explanations of the pattern seen using the probate data-set. The fact that rewards offered and re-runs of the same advertisement decline suggest property rights were very much enhanced by the law, reducing the chance of successful escape. If, instead, rewards had increased, it would suggest slave prices were increasing in the Upper South for reasons unrelated to the Act or slave-owners' property rights. Together, the empirical findings

only a few dozen were from the Upper South. Pritchett and Calomiris (2013) recognized the limits of the Fogel and Engerman data and collected Conveyance Records for many more slave sales. Their data-set was collected in order to examine the consequences of the threat of secession and the election of Abraham Lincoln as President. However, their data-set cannot be used to analyze the Fugitive Slave Act's effects as its earliest observations are from 1856.

[37] The Fugitive Slave Act did not come into effect until September 1850 but was mooted publicly and therefore price effects are allowed to preempt the law.

suggest a much more important role for slave escape than previously assumed by authors in the Fogel and Engerman tradition. Paradoxically, if slave escape was more important than previously thought, it strengthens Fogel and Engerman's overall thesis that slavery was far from barbarous and that slave-owners and slaves had a much more complex master-slave relationship than had been considered.

It is worth noting that the estimates presented likely underestimate of the importance of escape and slave-owner property rights. This is because difference-in-difference estimates can be biased upwards or downwards in the absence of a common trend in treatment and control groups. In this paper, the common trend assumption is likely violated but intuition suggests it is violated in such a way as to reduce the likelihood of finding any effects. The downward bias is due to both the Act *reducing* rather than totally *eliminating* the chance of escape and because of abolition and manumission efforts in the Free states.[38] In sum, the empirical evidence suggests that slave prices varied across regions not only due to productivity differences but also due to the perils associated with owning human beings who can act and choose for themselves in ways livestock and inanimate objects cannot. This finding is in sharp contrast to prior explanations of the regional price gap, suggests an important role for the threat of escape in limiting slave-owners brutality, and, as a consequence, shows that slaves' agency was an important factor within the peculiar institution.

[38]If influential in the area, these would have reduced demand for slaves in border states, all else equal.

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Appendix

A simple supply and demand framework can illustrate the source of the existing regional slave price gap along with the effect of a change in the likelihood of escape. First, suppose that the transportation of a slave from the Upper to the Deep South was not possible at any cost. Let there be a fixed (at least in the short run) total of N=n_u+n_d slaves where n_u and n_d of these are in the Upper and Deep South respectively. Suppose also that demand Q_i for slave labor in region $i = \{d, u\}$ is given by

$$Q_i = a_i - \left(\frac{b}{\rho(m_i)}\right) p_i$$

Where p_i is the price in region i and $\rho(m_i)$ represents the probability of recapturing a slave who escapes. The probability of recapture depends on m_i which represents the level of "public monitoring" (such as legal protections of the slave-owners property rights) in region i. Rearranging, this implies that (in equilibrium)

$$p_u = (a_u - n_u)\,\frac{\rho(m_u)}{b}$$

and in the Deep South

$$p_d = (a_d - n_d)\,\frac{\rho(m_d)}{b}$$

Empirically, we know $p_d > p_u$. Also, it can be assumed that $a_d > a_u$ corresponding to the idea that slaves were more productive in the Deep South, all else equal. All else was not equal and in particular, it is assumed $\rho(m_d) > \rho(m_u)$, so that the likelihood of recapture was higher in the Deep South. In this hypothetical world, slave prices are increasing in the probability of recapture in both regions. However, if there is no regional trade an increase in m_i in one region does not impact the other.

Alternatively, if trade from the Upper to the Deep South is possible at a fixed transport cost r, trade will depend upon the gap in prices between the regions. If $p_d < p_u + r$ then no profitable trade can occur and prices will be determined as in autarky. If $p_d \geq p_u + r$ then inter-regional trade can occur. Note that this expression holds with equality in a competitive market but not if the slave trade is monopolistic. The focus of this paper is not on the transport of slaves but on the demand for slaves, conditional on escape likelihood, in the two regions of the antebellum South. Therefore, a competitive slave transport industry is assumed to simplify the framework.

A competitive slave transportation industry implies that slave traders will move slaves from the Upper to the Deep south (reducing n_u and increasing n_d) until $p_d = p_u + r$. The appendix details the movement of slaves and price dynamics within such a framework. The Fugitive Slave Act affected m_u and, in turn, $\rho(m_u)$. It is assumed changes in $\rho(m_u)$ do not effect $\rho(m_d)$.[39] For a change in m_u;

$$\frac{\partial p_u}{\partial m_u} = (a_u - n_u)\,\frac{\rho'(m_u)}{b_u} > 0$$

With $\frac{\partial p_u}{\partial m_u} > 0$ the price paid for a slave in the Upper South rises with m_u because supply is fixed in any given period.[40] Before the increase in m_u the prices in each market were pinned down by a no-arbitrage condition $p_d = p_u + r$. Entrepreneurial slave traders/transporters trade away any gap in prices greater than the cost of transport r (i.e., arbitrage opportunities) by removing slaves from the Upper South and transporting them to the Deep South. The reduction in slaves in the Upper South results in rising prices, and the increased supply in the Deep South leads to falling prices restoring the no-arbitrage condition to equality.[41]

Starting from an equilibrium where $p_d = p_u + r$ the increase from p_u to p'_u determined by $\frac{\partial p_u}{\partial m_u}$ would suddenly leave $p_d < p'_u + r$, thereby *reducing* the gap in prices between the regions to less than r and precluding trade at equilibrium. If the Fugitive Slave Act had no effect on the Deep South, the price paid in the Deep South is unchanged at p_d.

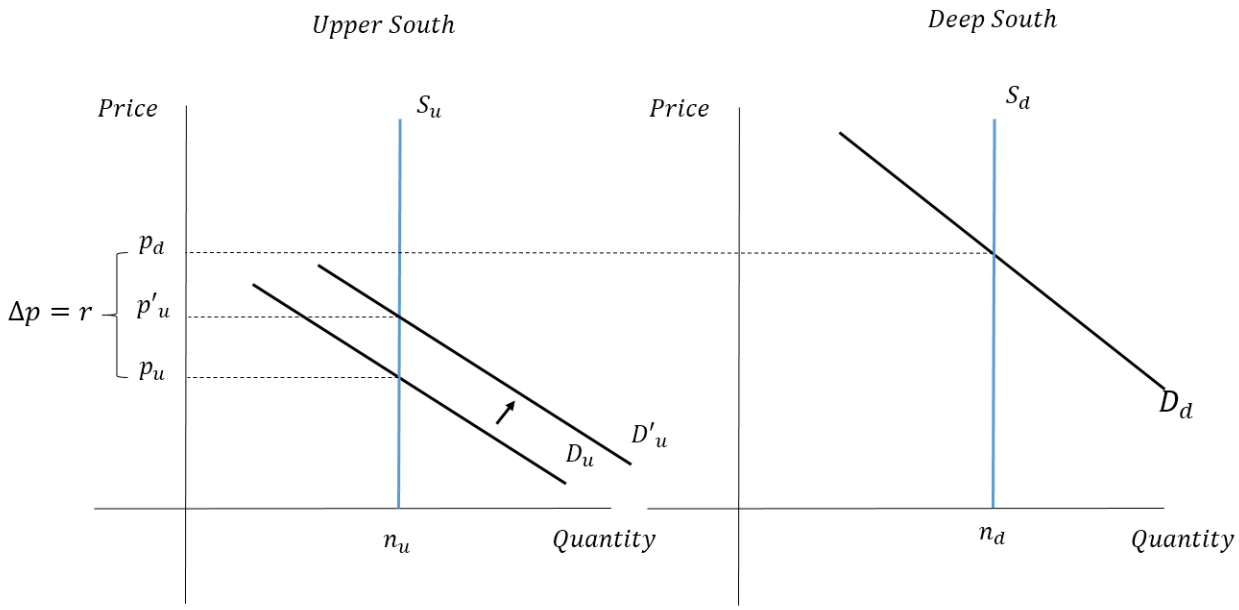
Figure 5 illustrates these dynamics. Initially, the supply in each region was balanced by slave transporters so that the prices in the two regions satisfy the no-arbitrage condition. Any movement of slaves from the Upper to the Deep South at the initial equilibrium price p_u would increase the supply in the Deep South (shifting supply rightwards) and ensures that the transported slaves would fetch a price $p'_d < p_u + r$ resulting in a loss for the trader. The overall impact of the Fugitive Slave Act increases demand from D_u to D'_u, causing the price in the Upper South to rise to p'_u.

[39] This is not a strictly necessary assumption.

[40] The term $a_u - n_u$ is weakly positive as $a_u \geq n_u$ from the definition of the demand function.

[41] Again, see the Appendix for a treatment of this process.

Figure 5: The Effect of an Increase in "Public Monitoring" on Prices

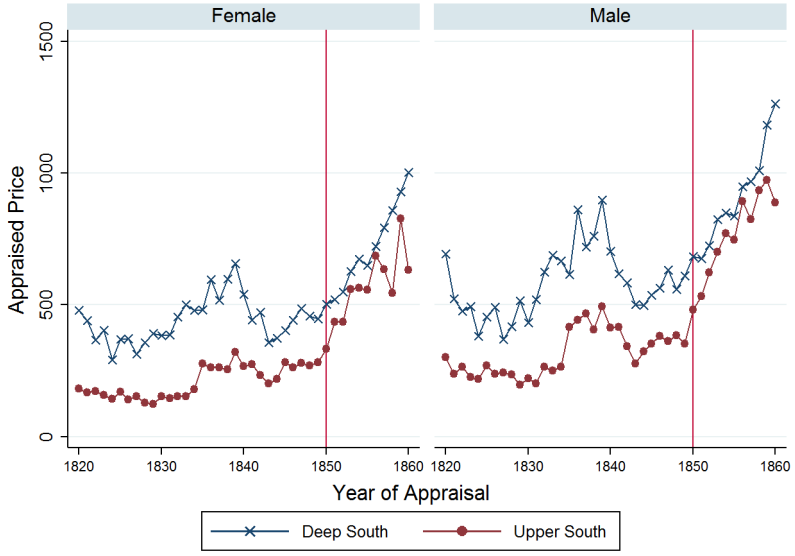


The Fugitive Slave Act reduced the likelihood a slave would escape and increased the chance they would be caught if they did, but only in the Upper South. This effect causes the demand curve to shift outwards and with a fixed supply, the price rises from p_u to p'_u.

Importantly, Figure 5 illustrates that the predicted effect of an asymmetric change in the level of public monitoring, which altered the likelihood of recapture only for slaves in the Upper South, is that *the gap in prices between the regions will fall*.

Note that allowing for the Act to also affect the autarkic price in the Deep South changes little in the analysis so long as $\rho'(m_u) > \rho'(m_d)$. If the Act affects both areas but the effect is larger in the Upper South, the price would simply rise in both areas but by differing amounts. If the effect of the Act was only to increase the market price in the Upper South by a relatively larger amount than in the Deep South, the gap between would fall by less than that observed in Figure 5. The data presented in Figure 6 seem to suggest that an increase in both regions, but a larger increase in the Upper South, was the empirical outcome. In Figure 6, the vertical bar denotes the introduction of the 1850 Fugitive Slave Act. While the gap in prices between the regions diminishes after 1850, prices in both regions increase relative to the trend before the law. This pattern is quite similar to Evans (see Figure 2), although Evans data only represented prices paid for "prime" male field

Figure 6: Slave Prices 1820-1860 in the Upper and Deep South

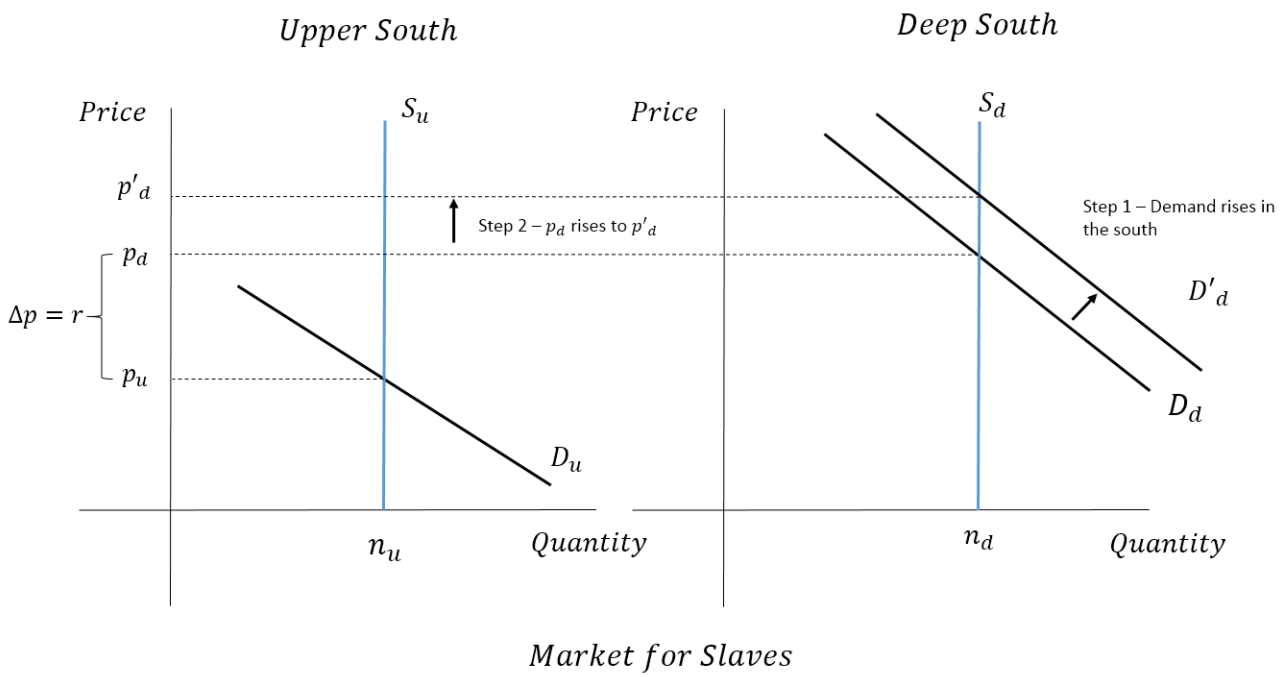


Source: Fogel and Engerman's Probate Appraisal Data-Set (ICPSR, 1974). The vertical red bar indicates the timing of the Fugitive Slave Act of 1850. While the inter-regional gap diminishes, prices in both regions increase. This pattern is quite similar to Evans, although Evans data only represented prices paid for "prime" field hands.

hands.

The process driving the transport of slaves from one region of the antebellum South to another is illustrated in Figures 7 and 8. Within the framework outlined in the paper, the movement of slaves between the regions could occur when the demand for slaves in the Upper South or the Deep South shifted. The illustrated example considers the effect of a shift in demand increases the demand for slaves at their current prices. Such a shift could be represented by a change in slave productivity due to agricultural technologies that only affected crops grown in the Deep South. The figures shows that first, the demand curve shifts to the right. As the supply of slaves is fixed in the short run, the effect is to increase the price of a slave in the deep south.

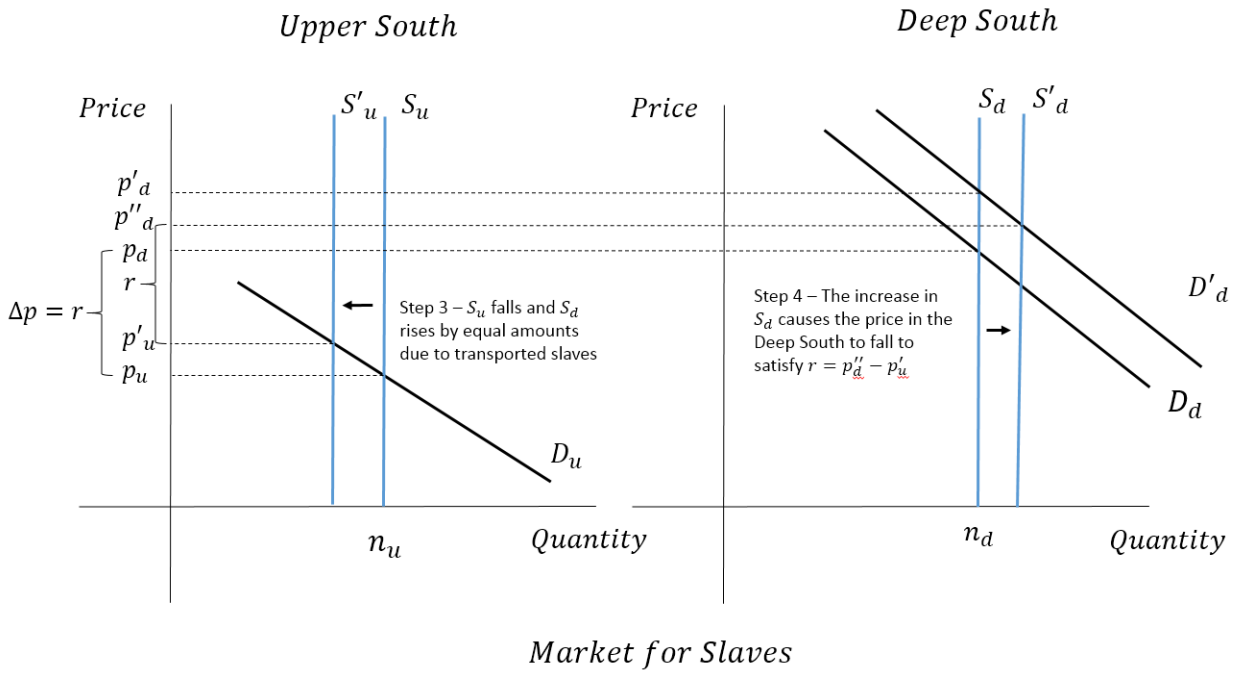
Figure 7: The Initial Effect of Increased Demand in the Deep South



The initial effect of the change in demand causes prices to increase from p_d to p'_d. This increased price induces slave traders to remove slaves from the Upper South and transport them to the Deep South, altering the supply of slaves in each region.

This increase in price leaves $p_d = p'_d > p_u + r$ and induces slave traders to purchase slaves in the Upper South at price p_u, transport them south, and prices adjust. The effect of a reduction in demand in the Upper South (such as one consistent with changing tastes for slavery, competition with free labor, or changes in the type of skills required in the more industrialized Upper South) would reduce the price in the Upper South, creating the chance for transporters to "buy low" in the Upper South, transport the Deep South, and "sell high" until the entrepreneurial arbitrage opportunity was eliminated.

Figure 8: The Initial Effect of Increased Demand in the Deep South



Once slave traders transport slaves south, the supply of slaves falls in the Upper South and increases in the Deep South so that the no arbitrage condition holds in equilibrium, $p''_d = p'_u + r$.