Start-up Nation?
Slave Wealth and Entrepreneurship in Civil War Maryland*

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Abstract

The American slave economy was not simply a coerced agricultural labor force. A recent historical literature has emphasized that slaves were also relatively liquid financial assets, and an important source of collateral for a wide variety of economic activities. Drawing on this idea, we use new data to estimate the effect of Maryland's 1864 uncompensated emancipation on business entry and exit. Using data on credit reports from Dun and Bradstreet linked to the 1860 census and slave schedules, we find that slaveowners were more likely to start businesses prior to emanicipation, even conditional on wealth and human capital, and this advantage disappears with emancipation. We argue that this is due primarily to start-up credit rather than any advantage in production. Slave rental markets were active until emancipation, muting any difference between owning slaves and using slave labor in production, and we show that wages did not appreciably change after abolition. In our data, abolition of slavery is not associated with any differential exit of slaveholder owned businesses. In addition, we find that slaveowners differentially start-up businesses even in mercantile, non-agricultural, and urban sectors with little slave production. Our results suggest that the collateral dimension of slave property rights makes the institution an even larger contributor to American economic development than is normally supposed.

JEL codes: D2, G2, J4, L2, M2, N21, N81
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1 Introduction

Slave property rights were a key institution in American economic development. The 4 million slaves at the beginning of the Civil War were an unwilling workforce that made Southern agriculture so immensely lucrative and dynamic a system that the Confederacy sacrificed much to defend it. Whether by gang labor and pace of work or frictionless movement to new territories on the frontier, the advantages of slavery in Southern agriculture are well-documented (Fogel and Engerman 1974, Wright 2006).

However, even as the bulk of the economics literature on slavery has focused on slaves as an agricultural labor force, many of the other contributions of slave property to American economic development have been neglected. This is despite the injunctions of prominent economic historians. Wright (2006, p. 69) notes that "An important component of planter mobility was the capacity to establish and maintain credit relationships across long distances, arrangements ultimately based on the asset value and liquid character of slave property". Slaves were financial assets, readily sold on ubiquitous auction markets (Tadman, 1990), pledged as collateral for loans (Martin, 2010) and used to settle payments and debts over long-distances (Kilbourne, 1995). Given the presence of potentially *more* liquid markets in slave assets, slave wealth could have allowed access to finance on better terms than other types of wealth, facilitating business startup. This paper examines this role of slave wealth in business formation in Maryland during the Civil War, using the 1864 uncompensated abolition as a shock to slaveowner wealth.

We find that 1860 slave wealth, conditional on total wealth, is significantly correlated with business formation in Maryland between 1860 and 1863, and this relationship disappears following the 1864 constitutional abolition. We argue that this is due to the high quality of slave wealth as collateral, rather than any advantage in production. We discuss a simple model showing that the collateral channel affects business formation, while the cost of production channel affects both business formation and business destruction. We then show that there is no effect of abolition on differential destruction of businesses owned by slaveowners. We present qualitative evidence that the slave rental market was active through 1864, and that wages did not abruptly change with abolition, further suggesting that there was little productive advantage conferred by slave ownership in Maryland. We see that slaveowners have an advantage in starting businesses even in non-agricultural, urban sectors, which were much less slave-intensive in production, and take this as further evidence of the financial channel. Indeed, we see larger effects in the merchant sector, which was particularly credit dependent and where slaves were unlikely to confer much productive advantage. While our evidence is indirect, we view it as suggestive of a financial dimension of American slavery that has been under-studied.

The importance of wealth and liquidity for entrepreneurship is well documented in both developed and developing economies.[1] However, little of this literature has considered differ-

[1] Evans and Jovanovic (1989), Evans and Leighton (1989), Meyer (1990), Holtz-Eakin et al. (1994), Lindh and Ohlsson (1996), Lindh and Ohlsson (1998), Blanchflower and Oswald (1998), Fairlie (1999), Dunn and Holtz-Eakin

ences in the composition of wealth. In particular, a common source of identification in the U.S. has been housing price shocks (Hurst and Lusardi 2004, Fairlie and Krashinsky 2012)[2], as well as inheritances or cash windfalls. These types of wealth differ in their liquidity, which may affect their ability to be pledged as collateral to obtain start-up funding. We take advantage of one of the largest destructions of wealth in U.S. history, abolition of slavery, to obtain estimates not only of the effect of wealth, but also its composition, on business formation.

A recent qualitative literature has been investigating the role of slaves in financial contracts. Richard Kilbourne's "Debt, Investment, Slaves" is perhaps the most detailed study of slaves as collateral. He shows that slaves were extensively deployed in credit market relationships. By inspecting credit relations in East Feliciana Parish in the 19th century, Kilbourne finds that slaves were sold for cash, while land was sold on credit, and this fact made slaves much more liquid and thus preferred as collateral. Kilbourne concludes that "The liquidity evident in the slave market all times dwarfed that of the land market...the slave market accounted for almost 80% of the total cash market for both land and slaves" (Kilbourne, 1995, p. 50). Starobin (1970), in his classic work on industrial slavery, also briefly describe a variety of businesses, from textile mills to railroads, financed by slaveowners and with shares purchased with slaves rather than cash.[3]

The recent historical literature has argued that these credit relationships were very important to the functioning of the larger Southern, and even the Atlantic economy. Johnson (2013) discusses the chains of credit that linked Mississippi planters to cotton factors in New Orleans, who in turn relied on credit from New York bankers and Liverpool merchants.[4] Martin (2010) shows, using a sample of mortgages, that the money raised by slaves mortgaged in Louisiana, South Carolina, and Virginia was often larger than the amount raised on the non-slave mortgages.[5] But quantitative estimates of effect of slave wealth on business formation have been absent.

The liquidity of the slave market throughout the South is also well documented. Tadman (1990) shows that the speculative market for slaves was extremely active, with planters only too willing to sell their slaves to traders at local auctions. Slave traders, acting as speculators and arbitraging price differences, helped maintain liquidity in the slave markets. A large literature

(2000), Johansson (2000), Taylor (2001), Hurst and Lusardi (2004), Zissimopolous and Karoly (2007), Zissimopolous and Karoly (2008), Holtz-Eakin and Rosen (2004), Giannetti and Simonov (2004), Giannetti and Simonov (2009), Nykvist (2008), and Fairlie and Krashinsky (2012).

[2]Wang (2011) uses a housing property rights reform in China to look at the effect of housing wealth on entrepreneurship

[3]Starobin also documents transportation companies that were able to rent out and sell slaves in order to raise capital.

[4]For example, the 1837 Financial Register wrote "Everyone knows that the cotton planters of the Southwestern states procure large supplies of clothing for their slaves, of every article required for their own consumption, upon credit from neighboring merchants in anticipation of next year's crop" Johnson (2013, p. 261).

[5]Martin reports that 33% of money raised via mortgages in Virginia in the national era was raised with slave mortgages. The corresponding numbers for national era South Carolina and Louisiana are 82% and 88%.

has explored to what extent the interstate transport of slaves was conducted by traders (rather than slaveowner migration). The recent literature concludes that this number is high, with Tadman (1990), Pritchett (2001), Deyle (2005), and Steckel and Ziebarth (2013) all documenting that between 50 and 70% of interstate slave movements was due to traders.[6] The liquidity of the market is also supported by other financial instruments that underwrote slave property rights, such as insurance contracts and warranties. Insurance contracts allowed slaveowners to hedge against slave illnesses and death, and tended to be used more by industrial and urban slaveowners (Levy, 2012). Warranties for slave defects (Wahl, 1996) solved potential adverse selection problems in the slave market.[7]

This modern understanding of slavery as a sophisticated system of property rights and financial contracts contrasts with an older literature that argued that slaveowners were less likely to pursue modern business activities. Genovese (1989) for example, argued that slaveowners were more concerned with status and seigneurial rights than economic profit. Olmsted (1852) and de Tocqueville (1838) also pointed out that slave institutions encouraged antipathy to profit-making on the part of slaveowners. While much of this has been repudiated by more recent scholarship, it has tended to focus on the agricultural labor dimension, neglecting the role of slaves as capital, and in the non-agricultural sector.

The idea that slaves could be a source of collateral should not be surprising to economists. A well-known argument by De Soto (2003), held that formal property rights in land were important for transforming informal assets into sources of collateral. Besley and Ghatak (2010) provide a comprehensive model and a survey of the literature on property rights and development, and this particular effect of secure property rights has received mixed empirical confirmation.[8] Slavery, by giving formal title to other people's labor, allowed human bodies to be pledged as collateral, which should allow slaveowners access to capital for many different kinds of activities, not just those involving slave labor.

Finally, the slave economy, and particularly the financial role of slaves, is informative for recent debates about "capital" as a physical input versus capital as a financial asset. For example, Piketty (2014) discusses the question of whether slaves should be considered a component of capital, or just a financial obligation owed by the slaves to the slaveowners. Ultimately, Piketty defines wealth as both financial assets as well as factors of production, and so slaves are counted as capital. Piketty does not include human capital in his definition of capital because in non-slave societies, the property right to human capital cannot be permanently sold on markets. But in the slave economy, human capital was in fact alienated, sold on markets,

[6] Very much contradicting the calculation in Fogel and Engerman of 16%.

[7] One curious case in Lynchburg, VA involves a slave Burwell given the power of attorney to mortgage himself for $1400, keep $50 and forward the rest of the money to his master.

[8] Galiani and Schargrosky (2010) find no effects of squatter titling on credit access in Argentina, and Field and Torero (2008) find that property rights in Peru led to increased public sector credit, but no increase in private sector credit. Besley et al. (2012) show that this collateral effect is heterogeneous in wealth and credit market competition, and draw on empirical evidence from Sri Lanka that again shows little increase in borrowing as a result of strengthened property rights.

and pledged as collateral. The bodies and skills of African-Americans were, in the antebellum South, capital in virtually all economically relevant dimensions, including financial ones.

1.1 Slavery and Credit in Maryland

By 1860, Maryland was the archetypical "middle ground". The northern part of the state was urban, industrialized, and overwhelmingly free. Baltimore had just over 2000 slaveowners and almost 5500 slaves in 1860, with slaveowners roughly 1% of its population. Partly this is because tobacco, the traditional slave crop grown in the state, was experiencing a steep decline in price over the 19th century. But, the rapid expansion of the Southwest, a large population of free blacks (owing to quite liberal manumissions earlier in the century), as well as the proximity of the free states all likely played a role in the decline of slavery in Northern Maryland.[9].

Southern Maryland and the Chesapeake area, however, was still very much slave country, and exerted influence well beyond their share of the state's economic activity (Fields, 1984). Politically and socially, Maryland's slaveowners exercised substantial sway over politics, passing an 1851 constitution that took the right of abolition out of legislative jurisdiction. Rural Maryland elites took full advantage of the inclusion of slaves in the legislature seat allocation[10] and the territorial allocation of the state senate to dominate Baltimore and the North politically. One symptom of this was that slave values were capped at $400 for the purpose of tax assessment, increasing their value beyond that of land and other forms of property. As we will see, the political defense of slave property was not purely ideological. Despite their relatively small holdings and low agricultural profits, Maryland slaveowners benefitted from their property via the sophisticated markets and contracts operating in Maryland.[11]

The total value of Maryland slaves at time of emancipation was roughly 30 million dollars, a relatively small fraction (just over 7%) of total state wealth in 1860. However, the sale market for slaves was quite active. Calderhead (1972) documents roughly one sale for every 10 slaves between 1830 and 1840 in slaveholding Maryland counties. Grivno (2007) writes of the national demand for slaves substituting for weak local demand "By the 1850s, slave prices in northern Maryland were largely underwritten by the interstate trade. "A prime able-bodied slave is worth three times as much to the cotton or sugar planter as to the Maryland agriculturalist," observed the Frederick Examiner in November 1858. "The principal interest of the Maryland slaveowner is . . . production for the southern market; for if that demand were cut off, the value of this property would depreciate from sixty to seventy percent." (Grivno, 2007, p. 95)

Slaves were used in both Maryland's urban and rural sectors. But slave ownership was

[9] Dittmar and Naidu (2014) find that the rate of fugitive slaves, as well as the rewards posted (relative to slave price) were both the among the highest in the country in antebellum Maryland

[10] Maryland approportioned seats in the state legislature counting slaves as full citizens, not three-fifths, for the purpose of representation.

[11] Besides lifetime slaves, Maryland also had free blacks on indentured Master and Servant labor contracts (Morris, 1948) and "term slaves" who were owned and traded until a fixed age or date.

not a prerequisite for using slave labor. As Barbara Fields writes "The small size of holdings in Maryland combined with the variability of labor requirements, especially on the part of urban employers and farmers engaged in mixed or cereal agriculture, to make slave hiring a ubiquitous phenomenon, much more common than sale"(Fields, 1984, p. 27). Rockman (2006) documents how slaves were used as workers on docks, in textile firms and indeed in many parts of the Baltimore economy, much of it via rental markets. In his biography, Frederick Douglass recalled his difficult stint rented out to farmer Edward Covey, only later to be employed as a ship caulker in Baltimore, all while owned by Thomas Auld. Whitman (1993) documents the extensive use of both permanent and rental slaves in the Baltimore chemical works in the late 1820s.

The active slave rental market, together with its relatively sophisticated banking sector, make Maryland an ideal location to study the financial dimension of slavery. Slave ownership did not necessarily force one to engage in slave-intensive activities. Instead, one could pledge a slave as collateral for a loan, use the loan to start a business that did not use slave labor, and then rent out the slave for additional income. As we will argue, slave ownership in the presence of thick rental and resale markets could facilitate a wide variety of business activities potentially far removed from slave labor. Even in the relatively advanced urban economy of Baltimore, slaveowners, while relatively few in number, had an advantage in starting businesses in the pre-1864 period.

Long term bank credit was scarce in Maryland. Bodenhorn (2002, p. 139) writes that bank charters "rarely calmed the agricultural sector's vehement demands for more banks and more credit or the number of proposals to supply them". Banks tended to supply short-term working credit rather than start-up financing, and took bills of exchange on goods as collateral rather than mortgage collateral. Private credit likely made up the difference, and although we do not have data assessing the volume of this type of loan, the qualitative evidence suggests that slaves were used as collateral to raise cash, often for other business ventures.

An example of private credit can be found in DePuydt (2013), which discusses the case of politician Outerbridge Horsey and John Lee, two Maryland slaveowners who, in 1828, mortgaged 65 of their slaves to the Linton household and Mr. Johnson in an effort to purchase a Louisiana sugar plantation. Horsey and Lee sugar ambitions did not survive however, and the pair wound up mortgaging even more slaves to finance their losing operation. Surviving mortgage documents allow us to see the slaves mortgaged, and Appendix Figure A.5 shows the distribution by age and sex, and shows that prime age males formed the bulk of the collateral. In the end, Linton and Johnson successfully sued Horsey and Lee for the debts owed, which resulted in forced sales of the mortgaged slaves and purchased plantation by the court.

Another source of evidence for the importance of slavery to credit relationships in Maryland is court records. Wahl (1996) argues that antebellum southern slave law converged on efficient rules for renting and selling slaves. Legislation in Maryland explicitly classified slaves as personal property and gave standards for mortgages that pledged such property as collateral. In Wahl's data, a large share of the cases in Maryland are for "transfer": either inheritance,

divorce, or for repayment of an obligation– such as a debt or a loan. Many Maryland cases appearing in the records of higher courts, such as Lee vs Pindle (1842) and Denton vs Griffith (1861), where 5 slaves were mortgaged for $1500, pit widows against creditors in courts over ownership of estate slaves. In Bruce vs Levering (1865), an 1861 mortgage, worth $1066 in 1865, was foreclosed on. The total value of the collateral posted was $981 but the two slaves pledged and worth $180, had been emancipated, so the creditor only held rights to $781.

Finally, slave mortgages were invoked as an argument against abolition during the Maryland Constitutional Convention of 1864. Given legal precedents that ruled that exempting property pledged as collateral annulled the mortgage contract, one representative argued that the constitutional protection of contracts implied that abolition was unconstitutional, declaring "there is no security for the debt in the mortgage besides except Negroes. They are emancipated. The contract is that the Negroes shall pay the debt. The act of the legislature destroys that contract." (Lord, 1864, p. 734).

1.2 Civil War and Abolition

As a border state, Maryland was strategically quite important. The Battle of Antietam (Sharpsburg) was the first declared win of the Union army. Because of this strategic importance, even slaveowners in Maryland were against joining the Confederacy, understanding that its location would compel the North to conquer it immediately. As it was, the Union army occupied Baltimore in 1861 and imposed martial law under General Butler, imprisoning many suspected Confederate sympathizers. The Civil War itself was largely confined to Western and Northern Maryland, but Confederate incursions were effectively repelled.

The state as a whole was quite anti-abolition, voting less than 5% for Lincoln[12] and refusing even compensated emancipation early on in the Civil War. However, as a result of this neutrality, Maryland was exempted from the Emancipation proclamation of 1863.[13] Instead, there was a referendum on a new constitution in late 1864 to determine whether slavery would continue in the "Middle Ground". This referendum was quite close, with the constitution passing by less than 1% of the vote. In addition, a few months before the referendum, the war department allowed *all* slaves to enlist, emancipating those that did. This, as much as the new constitution, destroyed slavery in Maryland.

Thus, the 1863 election, which went overwhelmingly to anti-slavery forces, was quite influenced by threats and coercion exercised by the Union army, and did not reflect the preferences of the population.

Despite delayed formal abolition, the Civil War challenged Maryland slavery. Confederate sympathizers fled following passage of martial law in 1861, and those that did not leave were

[12]Famously, Lincoln's assassin, John Wilkes Booth, was a life-long resident of Maryland.

[13]The Federal government in fact offered compensation for slaves emancipated in the border states in 1862, but Maryland refused.

politically persecuted by the occupying Northern army. But they were persecuted as rebels and secessionists, not slaveowners, and the Union army did not repress the slave economy during the early years of the occupation, despite widespread dislike of slavery among the troops. In fact, the Union army assisted in returning fugitive slaves and even conducted its own slave auctions during the Civil War in Maryland, as well as using slaves owned by loyal slaveowners to assist in the construction of fortifications. Despite this official policy, slaves believed the presence of Union troops slackened slaveowner property rights, and slave insubordination and flight increased with Union army presence. In 1863, the federal war department passed General Order 329, allowing enlistment of free-blacks, rebel-owned slaves and slaves volunteered by their owners in the border states. However, the enlistment of free-blacks, who were often on indentured labor contracts, raised labor costs enough that many slaveowners began to rely on slaves even more for labor. In addition, owners of enlisted slaves were generously compensated at $800 a slave in 1863, which kept their values as assets intact.

The interstate slave market thus weakened, but did not collapse during the Civil War. "In 1862, a Frederick County editor was shocked when six young slaves brought a meager total of $400 at auction. 'Less than two years ago servants of this description would have commanded $2,500,' he fumed. 'The reader will remember that [we] admonished the sympathizers with the rebellion, in advance, that this would be the consequence of the crime and folly of rebellion'." (Grivno, 2007, p. 108). The opportunity for slaveowners to sell or mortgage their human chattel still remained after the beginning of the Civil War, albeit at lower prices.

In particular the rental and hire market for slaves remained active through emancipation. Indeed, even as late as December 24, 1864 , the Frederick Examiner published an ad (paid from July 9th) that stated "To hire: a Negro woman, slave, who is a good cook, washer and ironer and can milk. One preferred without children". While we do not have surviving rental records from Maryland, in the Appendix we present data from Fogel and Engerman showing the volume and price of the Virginia slave hiring market, which faced, to a much lesser extent, some of the same challenges of maintaining slave property as Maryland.

2 Background and Data

2.1 Credit market and reports

We collected business reports from 1860 to 1865 in Maryland from the R.G. Dun & Company Collection (R.D. Collection, Harvard Business vol. 2, 7, 8 and 9). R.G. Dun & Company (now Dun and Bradstreet) was a mercantile agency that was founded by Mr. Lewis Tappan in 1841 (Wyatt-Brown, 1966). This agency, also known as the "Mercantile Agency", was created at a time when the U.S. economy was expanding, and there were increasing problems associated with information asymmetries between merchants and suppliers (Madison 1974, Norris 1978).

The Agency was initially organized in a way that credit reports were written by local at-

torneys, who were assigned to geographic areas. These attorneys would periodically collect information on credit constrained entrepreneurs and submit reports containing their names, assets, and credit standing. In a Mercantile Agency circular, Mr. Lewis Tappan instructs his correspondents to "record all facts that come to your knowledge, of persons changing their business, failing, moving away, new partnerships, etc.,... The name of every trader in your district should be reported, with all necessary particulars, whether they have ever purchased in this city or not." [14] (Lewis Tappan, circular, December 20 [1842]) (Olegario, 2006). In exchange for their service, attorneys would receive the management of the local debt collection from the agency's customers.[15]

Using the reports for Maryland in the R.G. Dun & Company Collection, we were able to identify individuals that needed credit for their businesses. Throughout the paper we refer to these individuals as "entrepreneurs" or "business owners".[16] We focused on entrepreneurs with a first report between January of 1860 and December of 1865. These entrepreneurs participated in local markets selling and producing a variety of different goods, including fancy goods, groceries, and dry goods. Entrepreneurs, after going through some screening mechanism, received goods from suppliers located in their local area or New York (Madison, 1974). In exchange, suppliers received credit notes from entrepreneurs, and thus a credit relation was established between them. Although there were several options to carry out the screening before a credit relation was established, the vast majority of suppliers used credit reporting agencies throughout this period, with the Mercantile Agency being the most prominent among these.[17]

There were a total of 1,568 credit constrained entrepreneurs with a first report between 1860 and 1865 in Maryland. Figure 1 presents examples of two reports included in our final dataset. When reading through these reports, we collected the following information: (i) name of entrepreneur, (ii) year and month of first record, (iii) year and month of last report, (iii) county, and (iv) activity (e.g. fancy goods). We follow the agency's stated objectives and we interpret the date of first report as the moment in time when the Mercantile Agency identified an entrepreneur seeking credit. Entrepreneurs were then tracked by the Agency approximately

[14] Norris includes similar information in his book: "Correspondents were expected to report local business news, court cases, changes in existing firms, and complete information on *new merchants entering business* in their area during the months between the semi-annual revisions" (our italics) (Norris, 1978, p. 24).

[15] As Lewis Tappan said: "a 'good collecting' attorney would be selected in each county to report on local entrepreneurs who visited New York to purchase goods. The attorney would assess each storekeeper's character, habits, business capacity, and capital, would gather other pertinent information, and would revise his report every six months. In return he would handle all subscribers' debt collections in his district" (Norris, 1978). Further information about the history of R.G. Dun & Company can be found in Norris (1978). Further information about credit reporting agencies in the nineteenth-century can be found in Madison (1974) and about Lewis Tappan in Wyatt-Brown (1966).

[16] As stated by Madison (1974), Tappan's idea was to create "a national agency that would gather information on *potential seekers of credit* and disseminate the data to wholesalers and others extending credit" (our italics). Some of these entrepreneurs are merchants, and we will exploit this fact in section 5.

[17] Brennecke (2014) provides more information about Antebellum U.S. credit markets and the information issues associated with it. The author also uses the Mercantile Agency records, but for the purpose of studying the process of information acquisition about business owners in New Orleans.

twice a year, although less frequently during the Civil War, until they went out of business. Similarly, we interpret the date of last report as a measure of business exit.

To expand our information about these entrepreneurs, we performed a name search of these 1,568 individuals in the 1860 U.S. census. We were able to find 620 of them.[18] From this additional data source we obtained their year and place of birth, sex, race, literacy, county of residency, and the value of personal and real estate.[19] In addition, we use the IPUMS 1% sample of the 1860 census (Ruggles et al., 2010) as a comparison group of individuals that did not appear in the Mercantile Agency reports and, therefore, were not credit constrained entrepreneurs. Finally, we use the 1860 U.S. Federal Census Slave Schedules to obtain information about the number of slaves each individual owned in 1860 for both entrepreneurs and non-entrepreneurs in Maryland. In the econometric analysis that follows, we restrict attention to white males between 14 and 89 years old without missing data for the covariates we use in our empirical analysis. This gives us a sample of 526 entrepreneurs, among which 70 ($\sim$ 13%) are classified as slaveowners.

2.2 Descriptive statistics

In Table 1 we present descriptive statistics for two samples of interest: (1) a representative sample of Maryland, i.e., individuals without reports; and (2) our sample of entrepreneurs. In the upper part of this table we present the mean and standard deviation of observable variables that we will use throughout the empirical analysis, as well as a column with the statistical difference between both samples. In the lower part of this table we present two variables of slave wealth, an indicator function that takes the value of one if the individual is classified as a slaveowner in 1860, and zero otherwise, and the logarithm of slave wealth. When using logarithms we calculate slave wealth by multiplying the number of slaves and the price of slaves in 1860 using data from Fogel and Engerman (1976b). The decision to use two slave wealth variables throughout the analysis is motivated by both our theoretical framework as well as for robustness.[20]

Following the literature on self-employment and credit access, we use an individual's non-

[18] When matching datasets we considered the name, last name, and county of individuals. The rate of unsuccessful matches was mostly because we did not observe the full name of many entrepreneurs (i.e., either we observed the initial of the first name and the last name, or just the latter). More about the data construction process can be found in the Appendix.

[19] From the instruction to the Marshals from the Department of the Interior (Washington, 1860): *value of real estate* is "the value of real estate owned by each individual enumerated. You are to obtain this information by personal inquiry of each head of family, and are to insert the amount of dollars, be the estate located where it may". *Value of personal estate* is "the value of personal property or estate. Here you are to include the value of all the property, possessions, or wealth of each individual which is not embraced in the column previous, consist of what it may; the value of bonds, mortgages, notes, slaves, live stock, plate, jewels, or furniture; in fine, the value of whatever constitutes the personal wealth of individuals."

[20] In particular, using these two variables provides a clear link between the predictions of the model and the empirical results.

slave wealth and human capital as control variables in our main regressions. An extensive literature, cited earlier, has documented the effect of an individual's wealth and human capital on the likelihood of starting a business and getting access to credit. The theoretical framework we present in the following section also takes into account these intuitive findings. By including these variables as controls in the subsequent analysis, we assure a comparison between individuals with similar wealth and human capital levels. In some specifications we use the logarithm of non-slave wealth, and in others we split this variable and use the logarithm of personal estate value and the logarithm of real estate value, as documented in the 1860 Census. The final three variables in the upper panel (Baltimore, agro-business, merchant) will be used to perform sub-sample analyses that inform us about specific demand shocks and the nature of businesses we observe. Table 1 shows some arguably expected patterns. Entrepreneurs are on average richer, have higher human capital, are more likely to be located in Baltimore, tend to work relatively more in non-agricultural sectors, and half of them are merchants (25 percent of non-entrepreneurs work *for* merchants).

The lower panel in Table 1 shows the mean and standard deviation of our two slave wealth variables.[21] Approximately 4 percent of the Maryland sample is classified as slaveowner, while 13 percent of entrepreneurs are in this category. The second slave wealth variable we use is simply the logarithm of the total number of slaves owned by an individual, multiplied by its market price as previously discussed. For comparison with historical accounts of Maryland, it is useful to discuss absolute numbers. A total of 61 individuals in the Maryland sample are classified as slaveowner. An average slaveowner in this sample had 7.5 slaves (median of 4). A total of 70 entrepreneurs, on the other hand, are classified as slaveowners. An average slaveowner entrepreneur had 2.5 slaves (median of 2). These numbers imply that a total of 621 slaves are implicitly included in our dataset, around 12 percent of all slaves located in Baltimore, as measured by the 1860 Slave Schedules.

Another important aspect of our dataset is that the vast majority of entrepreneurs are located in Baltimore, the economic and financial center of Maryland. To have a sense of their spatial locations, and their relationship to the overall state slave-economy, Figure 2 plots a map of counties in 1860 Maryland, with the total number of slaves, and the spatial distribution of slaveowner and non-slaveowner entrepreneurs.[22] This map clearly shows that most of our entrepreneurs are located in the northern part of the state, a pattern that is similar for both slaveowners and non-slaveowners in our sample. Because most entrepreneurs are located in Baltimore, this suggests that our results are unlikely to be driven by sector specific shocks, as they are all essentially participating in the same market. Later on we confirm this intuition by restricting attention to entrepreneurs located in Baltimore and other sub-samples.

Finally, Figure 3 shows the time variation patterns observed in the dates of first (entry) and

[21] In empirical exercises we present in the Appendix we experimented with the fraction of slave wealth over total wealth as main independent variable. We obtained qualitatively similar results. However, we decided not to include them to be consistent with out theoretical framework.

[22] As we do not have the exact location of most entrepreneurs, we simply locate them in approximately the centroid of each county for presentation purposes.

last (exit) reports. The y-axis shows the number of entrepreneurs with a first/last report in the date specified in the x-axis. In addition, we plot the beginning of the Civil War (April 1861) and abolition of slavery in Maryland (November 1864) with a red line. Overall, you can see the compression in entry after the beginning of the war and the subsequent increase at the end of it. We will discuss how these events affect our analysis in the next section, and we already discussed how the slave market did not collapse during this time period. In addition, in the Appendix we show that the value of slave sales did not decrease significantly before 1864, suggesting that the slave market was still quite active, and close-by markets, such as the one in Alexandria, were still operating.[23] As we observe a significant number of first reports after abolition of slavery, this sample serves as a good falsification exercise, which we discuss in Section 4. Panel B is the analogue of Panel A using the last instead of the first report. The vast majority of exit occurs after abolition of slavery, and we can actually observe a spike in exit a couple of months after this event. We will use this time variation later on to inform us about mechanisms at work.

3 Theoretical Framework

In this section we discuss a simple theoretical framework, based on a credit rationing model in Tirole (2006), to study the effects of slave wealth on business entry and exit, before and after abolition of slavery.[24] In the model, there are two sets of agents: (1) credit constrained entrepreneurs endowed with business projects, and (2) suppliers that offer credit to these entrepreneurs. Entrepreneurs pledge assets and future profits to obtain start-up funding for their business projects.

An entrepreneur can be either a slaveowner or a non-slaveowner. Slave wealth is allowed to play two different roles: (1) slaveowners could have a relative advantage in using coercion to increase slave productivity, and (2) suppliers could prefer slave wealth over other pledgeable assets (e.g. land) due to its higher liquidity.[25][26] We call these the "cost of production" channel

[23]This might be surprising if slaveowners anticipated emancipation without compensation. Calomiris and Pritchett (2013) show that slave prices in New Orleans fell in anticipation of war, but argue that this was not due to fear of emancipation in particular so much as the overall economic impact of war.

[24]See the Appendix for a detailed discussion of the model.

[25]We interpret this role of slave wealth as the relative advantage of slaveowners in using coercion to make slaves more productive. We follow Acemoglu and Wolitzky (2011) who present a framework where effort and "guns" are complements in equilibrium. Coercion in this case allows slaveowners operate with fewer workers and, as a consequence, at a lower cost than non-slaveowners. Note that if slaveowners have no relative advantage in using coercion, then ownership is not necessary for enjoying the benefits of slave labor.

[26]In a model with buyer-seller matching frictions, the price of an asset (determined by Nash bargaining) can be written as a function of market tightness. This result implies that two assets may have the same value under the same market tightness (e.g., land and slave wealth), but different values when the market for one of these assets has relatively more buyers. This idea has been incorporated into the literature studying how asset liquidity (or redeployability or market tightness) affects the terms of a loan (Williamson 1988, Shleifer and Vishny 1992, Hart and Moore 1994, among others). These articles argue that loan conditions (i.e., maturity, debt-to-value, promised

and the "collateral" channel, respectively. We examine how business entry and exit decisions are affected when either or both of these channels are active.

In the model, entrepreneurs must exert effort (i.e., complete labor tasks) for their businesses to be successful. Projects have a positive net present value (NPV) only when entrepreneurs exert effort. If exerting effort was given, all projects would be funded, as expected returns of the project exceed initial investment (i.e., positive NPV). However, exerting effort is costly. This implies that entrepreneurs must be rewarded with a sufficiently large fraction of future profits for them to be willing to exert effort. This puts limits on the amount of future profits that entrepreneurs can credibly pledge to suppliers.

Business formation occurs when an entrepreneur obtains project funding. Lenders provide funding as long as expected payments exceed the value of the loan. Given that costly effort limits the amount of future profits that can be pledged, entrepreneurs are forced to pledge assets in addition to future profits. This situation explains why only a fraction of these positive-NPV projects are funded in equilibrium (i.e., those that are managed by entrepreneurs that own a sufficient amount of pledgeable assets).

3.1 Slave wealth and business formation

In the model, slave wealth may affect project funding outcomes through both the production and collateral channels. When the cost of production channel is active, it is relatively cheaper for slaveowners to exert the effort required for business success. The lower cost of effort comes from slaveowners' relative advantage in using coercion to increase slave productivity and reduce the number of workers required for production. This allows slaveowners to credibly pledge more of their future profits as they require less compensation for their effort as exerting effort is relatively cheaper for slaveowners. As a result, a slaveowner is required to pledge fewer assets for obtaining project funding as assets and future profits are substitutes. This implies that a slaveowner will obtain project funding with a higher probability than that of an equally-wealthy non-slaveowner when the production channel is active, since the former needs to pledge fewer physical assets to acquire start-up funding.

When the collateral channel is active, slave wealth is deemed as better collateral by lenders. This is based on the premise that while two assets may have similar "fundamental" values, their relative resale price will be a function of the liquidity (or market tightness) of these assets, as discussed above. Again, this implies that a slaveowner will obtain project funding with a higher probability than that of an equally-wealthy non-slaveowner, since the latter must pledge relatively more wealth due to the lower resale value of non-slave wealth.

Then, the model predicts that when either channel is active, slaveowners have a relative advantage in getting project funding (all else equal). This advantage, however, disappears after

debt yield) improve with the liquidity of the collateral asset. Benmelech et al. (2005) provide evidence from the commercial real estate market that supports these predictions.

abolition of slavery. Abolition eliminates both the production and collateral channels and, as a consequence, makes business entry an equally-likely event for entrepreneurs of same wealth levels regardless of whether they were slaveowners in the past.

3.2 Abolition and business exit

The model also provides predictions of how the rate of business failure is affected by abolition. In the model, businesses fail with certainty when entrepreneurs do not exert effort, and with some probability when they do. Loan agreements are designed to provide entrepreneurs with sufficient incentives (through a share of the future profits) to exert effort.

We note that loan agreements that were signed before abolition, and that did not make the incentives provided to slaveowner contingent upon abolition, may have failed to provide sufficient incentives to exert effort. This happens because, if the cost of production channel is active, exerting effort becomes more costly to slaveowners after abolition as coerced slaves are no longer available to slaveowners. If this state of the world was not reflected in the loan agreement, then the model predicts that these entrepreneurs would choose to let their businesses fail. Again, we expect this change in incentives only to affect those entrepreneurs with loan agreements that were signed before abolition, and not those with loan agreements that were signed after it.

In sum, we obtain three insights from the model. First, both the cost of production and collateral channels imply that, conditional on total wealth, slaveowners are more likely to enter the market because they are required to pledge less wealth than non-slaveowners to obtain project funding. Second, since abolition eliminates any potential benefits from slave wealth, slaveowners and non-slaveowners enter with equal probability after this event. Finally, abolition has an effect on the likelihood of business exit among slaveowners *only if* the cost of production channel is active. We use these insights to guide our interpretation of the relative importance of these mechanisms.

4 Empirical Framework

Following our theoretical framework, we explore whether there is evidence of slave wealth affecting business entry and exit patterns through the collateral and/or the cost of production channel. In order to test these hypotheses, we use a simple comparison of means of slave wealth between (i) individuals with credit reports between January of 1860 and December of 1865 and (ii) a representative sample of people living in Maryland in 1860. We interpret the first set of individuals as credit constrained entrepreneurs, and the second set as non-entrepreneurs. Econometrically, we estimate different versions of the following cross sectional regression:

$$y_i = \alpha + \beta \cdot \text{Slave Wealth}_{i,1860} + \delta \cdot \text{Non-Slave Wealth}_{i,1860} + \gamma' X_{i,1860} + \varepsilon_i \quad (1)$$

where y_i is an indicator variable for individual i that takes the value of one if he had a first report before abolition of slavery, and zero otherwise. In addition, α is a constant term, *Slave Wealth*$_i$ is a measure of slave wealth, *Non-Slave Wealth*$_i$ is a measure of non-slave wealth, X_i are control variables for human capital, and ε_i is an error term robust against heteroscedasticity. Note that all right hand side variables are measured in 1860, before the time of an individual's first report, so reversed causality is unlikely to be an empirical concern in our setting. Nevertheless, we make the assumption $\mathbb{C}ov(\text{Slave Wealth}_i, \varepsilon_i | X_i) = 0$ in order to consistently estimate the parameter of interest β. We provide a discussion of this assumption, together with several empirical exercises to evaluate its plausibility, in Section 5.2.

If slave wealth facilitates access to credit, then it potentially affects business formation. If this hypothesis is correct, we should observe that individuals with relatively more slave wealth are more likely to have a first report before abolition of slavery, i.e we should observe that $\beta > 0$. Nevertheless, recall that we are observing a sample of *credit constrained* entrepreneurs, not the entire population of entrepreneurs. Then, our empirical estimates should be interpreted as the effect of slave wealth on businesses that required external funds to operate, and not as the effect slave wealth had on an average business in Maryland during the 1860s.[27]

The second dependent variable we use is an indicator function that takes the value of one if an individual had his *last* report the year following abolition of slavery. Recall that, due to the business model of the Mercantile Agency, this date is highly correlated with business exit. In addition, when running regressions using this dependent variable, we restrict attention to entrepreneurs that did not exit before November of 1864, as those are the ones who could have exited in response to abolition. Approximately 11 percent of business owners exited one year after abolition. This is a relatively large number compared to exit in other periods. We can clearly see this in Panel B of Figure 3. As robustness checks, we have experimented with other time windows following abolition and obtained qualitatively similar results.

Our main regression results employ all individuals in our dataset with a first report between January of 1860 and December of 1865, approximately five years before and one year after abolition of slavery, and all individuals in the representative sample of Maryland. Recall that there are a total of 368 individuals with a first report before abolition, 158 individuals with a first report within one year after abolition, and 1,554 individuals that did not have a report in this time period. In some empirical excercises we compare slave wealth among individuals with a first report *after* abolition of slavery with the rest of individuals. As slave wealth should have been destroyed after abolition, we should not observe a post abolition effect of slave wealth after controlling for other types of wealth (i.e., we expect $\beta = 0$).

In what follows, we also use two different measures of slave wealth. We do this to check our estimates are not driven by functional forms, to interpret and compare our results between

[27] Alternatively, one could add structure to this selection mechanism and use a Heckman approach. In unreported results we used non-slave wealth and the human capital variables to explain our entrepreneur indicator, and included those predicted probabilities non-linearly using the inverse of the Mills ratio in a within entrepreneurs regression: results are qualitatively similar.

β and δ —the effect a dollar of slave wealth and a dollar of non-slave wealth had on business entry— and to be consistent with our theoretical framework. In our simplest specification we use an indicator variable for individuals that were slaveowners in 1860 and control for non-slave wealth. Then, our coefficient of interest β simply measures the differential probability of starting a business before abolition of slavery for non-slaveowners and slaveowners.

In our second specification, we use the logarithm of slave wealth. To construct slave wealth in dollars, we use the total number of slaves each individual owned in 1860 and the price of slaves in Maryland in 1860, as recorded in Fogel and Engerman (1976b). Then, we can easily compare the effect of a dollar of slave and non-slave wealth. In particular, β (δ) is interpreted as the effect of a one percentage point change in slave (non-slave) wealth on the outcome of interest. We believe that this last specification is more consistent with our theoretical framework in the sense that it captures variation in the liquidity of an individual's wealth. This δ coefficient is presented in all specifications to allow comparison with the coefficient β on slave wealth. In addition, and following the entrepreneurship literature, we control for human capital differences by adding an indicator function that takes the value of one for illiterate individuals, and zero otherwise, age, and age squared.

Finally, we perform a sub-sample analysis by restricting attention to (i) individuals located in Baltimore, and (ii) individuals working in non-agricultural sectors, and (iii) merchants. This emphasizes the importance of slaves in Maryland's non-agricultural sectors. While we take this as evidence of the collateral channel, the cost of production channel bears on an old debate in the economic history of slavery, on the suitability of slave labor for industry.[28] Specifically, we run the same cross sectional regression in equation (1), but now restricting attention to a subset of individuals. Then, we interpret similar (positive) coefficients β as evidence of slaves playing a role in the industrial sector. This is a more flexible way of presenting subsample results than including an interaction term between slave wealth and an indicator variable for the subset of individuals of interest, as we are not imposing any restrictions on other parameters (i.e., α, δ, γ).

5 Main Results

Before presenting estimates of equation (1), we summarize our main dependent variable and compare it between slaveowners and non-slaveowners. Panel A of Figure 4 does this before and after abolition of slavery. Specifically, on the left side we plot the difference in means in the indicator for a first report before abolition between slaveowners and non-slaveowners. The numbers in the y-axis indicate that non-slaveowners had a 16 percent probability of having a

[28] Bateman and Weiss (1981) argued that industries in the South were equally profitable as slavery, and so the concentration of wealth in slaveholdings was a puzzle. Starobin (1970) argued that slaves were extensively used in industrial enterprises, and Goldin (1976) documented the ubiquity of slaves in the cities, countering Wade (1964). Sokoloff and Tchakerian (1997) present evidence that rural manufacturing TFP and value added were not different between the South and the East North Central regions, suggesting that Southern manufacturing was not particularly disadvantaged by slavery. This literature has focused on slavery as a system of labor, not as a system of credit and capital.

first report before abolition, while for slaveowners the same number is 43 percent. As we previously stated, this first report is highly correlated with business entry, which then means that slaveowners are more likely to form a business before abolition than non-slaveowners. In particular, the difference is large, as slaveowners are almost three times more likely to have a first report before abolition. The right hand side of this panel is the analogue of the left hand side, but now using an indicator variable for having a first report *after* abolition of slavery. Interestingly, there is no statistically significant difference between the rates of business formation between slaveowners and non-slaveowners after this event.

Panel B in Figure 4 repeats this exercise but now using the beginning of the Civil War as an event of interest. Consistent with the evidence we have shown (i.e., the slave market did not collapse during the Civil War), we observe the same differential rates in business formation before and after this event. One might think that the Civil War certainly could have changed the economic behavior of slaveowners. While some of the fleeing confederates relied on local jails to keep their slaves, others may have sold them off. Persecution of confederates could have also affected the propensity of slaveowners to start businesses. In addition, occupation could have reduced the willingness of suppliers to extend loans to slaveowners. However, in all of these cases we should expect the differential propensity to start businesses to disappear after the beginning of the Civil War, something that, as previously discussed, we simply do not observe.[29]

In what follows we discuss the robustness of these patterns, perform several different robustness and falsification exercises to examine a potential causal effect from slave wealth on business formation, and link estimated coefficients directly to our theoretical framework. Our main conclusion from this section is that the evidence suggests there is a strong and robust association between slave wealth and business formation, something not observed for less liquid wealth. In addition, this relationship is considerably weaker after abolition, but not between the beginning of the Civil War and abolition. From the point of view of our theoretical framework, this result is consistent with both the cost of production and the collateral channels being active.

To distinguish between the collateral and cost of production channels, we study the role of slave wealth on business exit and find no differential rates of exit following abolition. From the perspective of our model, this result suggests that slave wealth was being used as collateral instead of for lowering the cost of production. This is supported by additional evidence on labor market outcomes not being affected by abolition.

[29]The impact of the Civil War on the overall credit market is also potentially important. The National Banking Acts, Federal currency, and in particular the borrowing of specie by state governments from their banks are all potentially large shocks. However, these shocks are likely common to slaveowners and non-slaveowners, in addition to having less of an impact on the private credit that is our focus, and thus we do not pursue this further.

5.1 Slave wealth and business formation

Table 2 presents the main results of this paper, that is, the results on the effect of slave wealth on business formation. In Panel A we present the regression analogue of Figure 4 and in Panel B we disaggregate total wealth into three parts to estimate the effect of slave wealth on business formation and compared to other types of liquid wealth (i.e., personal wealth) and other types of less liquid wealth (i.e., real estate wealth). When interpreting results in this second panel we interpret the coefficient on real estate wealth as revealing the relative credit-worthiness of a non-movable asset such as land.

Throughout the tables we always present five different specifications. Column 1 shows the simplest one, where we only include a measure of slave wealth. Motivated by the entrepreneurship literature, column 2 includes non-slave wealth and our human capital variable as controls. The following two columns are exactly the same as column 2 but restrict attention to individuals located in Baltimore (column 3), and those working in non-agricultural businesses (column 4). We view these two sub-sample exercises as complementary rather than independent, as non-agricultural businesses are more likely to be located in urban areas and Baltimore is the largest urban area in Maryland. To the extent that estimates do not systematically differ in these two sub-sample exercises, we conclude that our estimates are unlikely to be driven by the agricultural sector. Finally, in column 5 we focus on merchants, which directly speaks to the financial mechanism we emphasize, as it estimates our main regression using only individuals in a credit-intensive sector, where slaves were unlikely to yield a comparative advantage in production.

5.1.1 Before abolition of slavery

Column 1 in Panel A indicates that slaveowners had a 26 percent higher probability of having a first report before abolition of slavery. As first reports are highly correlated with business entry, this means that slaveowners are more likely to form a business in this time period. The baseline probability of forming a business is 18 percent, which means that, in addition to being statistically significant, the coefficient is large in magnitude. Column 2 shows that this difference is robust to including non-slave wealth and our human capital variable as controls, which also have estimated coefficients of the expected sign.

Perhaps more interestingly, Panel B shows shows that slave wealth has a similarly positive and statistically significant coefficient as personal estate wealth. Both coefficients are statistically different from the coefficient on real estate wealth, which at the same time is close to zero and has a negative sign. In order to interpret these results more clearly, consider a one standard deviation increase in slave (2.0), personal (3.5), and real estate wealth (3.6). These estimated coefficients suggest that, as a response to this variation, the probability of having a first report before abolition increases by 33 and 63 percent in the former two cases and it *decreases* by 12 percent in the case of real estate wealth. This result suggests that, conditional on total wealth, slaveowners had a higher likelihood of obtaining credit and, as a consequence, a

higher likelihood of entering the market.

As previously mentioned, these results are consistent with the cost of production channel, the collateral channel, or both. Before we attempt to distinguish between these channels, we discuss whether this empirical result is affected by the civil war.

5.1.2 Before and during the Civil War

As previously discussed, there are many potential reasons to worry about a differential impact of the Civil War on business formation by slave ownership status. However, historical evidence, data on slave sales shown in the Appendix, and our preliminary results in Panel B of Figure 4, suggest the slave market was active even in 1863, two years after the beginning of the war. In order to more systematically analyze the effect of the Civil War in our sample of credit constrained entrepreneurs, we study the rates of business formation before and during this time period.

Table 3 presents regression results of our main estimating equation, but now using an indicator that takes the value of one for individuals that started a business sometime between January of 1860 and April of 1861, before the beginning of the Civil War. Approximately 8 percent of all individuals in our sample started a business during this period. Then, the estimated positive and significant coefficient of 0.136 is large when compared to the baseline. This coefficient is also robust to including control variables and is slightly stronger among individuals working in non-agricultural businesses. The only exception is that the coefficient is somewhat smaller and non-statistically significant when we restrict attention to individuals located in Baltimore. Nevertheless, the coefficient is still positive in that case, and only half of the uncontrolled coefficient, which suggests there could be a large effect, but we do not have the statistical power to detect it. Just as before, the coefficient on non-slave wealth is positive and of similar magnitude than before (i.e., increasing non-slave wealth by one standard deviation increases the likelihood of business formation by 67 percent in this case, similar to the 63 percent previously estimated). In addition, Panel B shows results using all three different measures of wealth as right hand side variables, and the patterns are remarkably similar to our findings in Table 3.

What happens to the differential rates of business formation during the Civil War by slave ownership status? Approximately 11 percent of our sample of individuals have a first report during the Civil War, so we can check if there is some differential rate of business formation that can be explained by slave wealth. In Table 4 we do this by performing the same empirical exercises as in Tables 2 and 3, but now using as dependent variable an indicator function that takes the value of one for individuals that started a business between April of 1861 and November of 1864, after the beginning of the Civil War but before abolition of slavery. In Panel A we observe that slaveowners are more likely to have a first report during the Civil War than non-slaveowners and the magnitude of the coefficient is remarkably similar to the one from before the beginning of the war. Also noteworthy is that now the coefficient for slaveowners

in the Baltimore sub-sample is much larger and statistically significant at conventional levels. This suggests that the beginning of the Civil War did not have an impact of the differential rates of business formation by slaveowners and non-slaveowners. We are not saying that the war did nothing to the economy of Maryland, in fact the level of business formation is indeed lower during this period, but as we discussed in section 3, we are actually concerned only about the difference between slave and non-slaveowners to test for the hypothesis that slave wealth has an effect on start-ups. Regarding the economic magnitude of these estimated coefficients, note from Panel B that a one standard deviation increase in slave, personal, and real estate wealth, is associated with an increase in the likelihood of business formation of 27 and 56 percent in the former two cases, and with a *decrease* of 22 percent in the latter case. These results again suggest that wealth liquidity is an important variable for explaining start-ups.

5.1.3 Estimates by year

A different but related approach could use the year to year variation to check for differential rates of business formation by slave wealth. We take this approach in Table 5 and check whether slave wealth is associated in a similar way in every year between 1860 and 1865. That is, we use an indicator variable that takes the value of one for start-ups in years 1860, then 1861, and so on until 1865.

Interestingly, Panel A shows that the estimated coefficients on the indicator variable for slaveowners is decreasing over time. To be more precise, we need to calculate the standardized coefficients by dividing these estimates by the mean of the dependent variable. When doing this, our estimates suggest that the economic magnitude is large and fairly stable for the years 1860, 1861, and 1862, then it decreases slightly in 1863, and falls to half of the size in 1864 and 1865. Although still marginally significant in 1864, this is not entirely inconsistent with our theoretical background, as abolition of slavery occurred in last months of this year. Then, using these yearly estimates as motivation, we group years 1860–1863, and 1864–1865 and run similar regressions. Results show that, once again, the empirical association between slave wealth and start-ups is positive and statistically significant only for businesses that started before 1864. A similar pattern emerges when we split wealth in slave and non-slave wealth in Panel B. Note also that the coefficients on personal wealth are remarkably similar across specifications, which suggests that what we observe with slaveowners is not something related to any type of wealth, but something specific to slave wealth.

In sum, results in Tables 4 and 5 confirm the historical and empirical evidence previously presented: the Civil War did not seem to have had a differential impact on the rates of business formation between slaveowners and non-slaveowners, although it certainly could have had an effect on the overall rates of business formation, as Panel A in Figure 3 suggests. The effect of slave wealth on business formation is fairly stable over the years 1860-1862, decreases slightly in 1863, and falls dramatically in 1864 and 1865. In the remainder of this section we discuss potential endogeneity issues, heterogeneity and robustness checks, and we test for differential exit rates following abolition of slavery in Maryland.

5.2 Endogeneity

Until now, all of our results suggest that slaveowners are more likely to start a business before abolition of slavery. However, the main concern with these estimates is that slaveowners could differ in many other aspects from non-slaveowners, so claiming causality from slave wealth to business formation before abolition becomes difficult. For example, it is possible that slaveowners have a different set of social capital than non-slaveowners and this, not slave wealth, is what matters at the moment of getting project funding and starting a business. Unfortunately, there is no empirical test that will completely rule out this possibility, but we can provide empirical exercises that point towards the direction of a causal relationship between slave wealth and business formation.

An exploration of causality is possible with our dataset because we collected information on credit constrained entrepreneurs with first reports until December of 1865. In particular, there are a total of 158 individuals that started a business after abolition of slavery. Importantly, some of these individuals were classified as slaveowners in 1860. However, because abolition of slavery already took place, all of their slave wealth should have been destroyed. This means that, when replacing our main dependent variable with an indicator function that takes the value of one for individuals with a first report *after* abolition, we should *not* observe differential rates of start-ups by slave ownership status. If that is indeed the case, we can have more confidence that our estimates are not driven by unobservable variables specific to slaveowners.

Table 6 presents estimates of our main equation but using an indicator variable that takes the value of one for individuals with a first report between November of 1864 and December of 1865. Reassuringly, in Panel A we do not observe any statistically significant relationship between our indicator variable for slaveowners and the likelihood of business formation. It is important, however, to highlight that coefficients are indeed positive across specifications. Nevertheless, when calculating standardized coefficients we note that all coefficients are significantly smaller than those estimated in Table 2. In particular, the coefficients are three times smaller in both panels in this table. If we are to take these estimated point coefficients seriously, this means that no more than a third of the effect we found in Table 2 can be explained by observable variables that are common between individuals classified as slaveowners in 1860 that started a business before and after abolition.

5.3 Additional results

Before taking the data to the last prediction of our theoretical framework (i.e., differential exit rates by slave ownership status), we discuss some additional results related to entry patterns. Panel A in Figure 5 presents graphically our main result in different sub-samples. As previously discussed, we observe higher rates of business formation among slaveowners before abolition in all sub-samples. We interpret restricted estimations in Baltimore and non-agricultural businesses as something informative about the non-agricultural nature of entrepreneurs in our sample. In an additional exercise, we estimate our main equation restricting attention to in-

dividuals located in South Maryland and results are remarkably similar.[30] We chose not to present this sub-sample in our main regression results because we have much fewer individuals in this part of the state and standard errors increase considerably.

Our first robustness check relates to the functional form used when measuring slave wealth. The decision that motivated us to use both an indicator for slaveowners and total slave wealth relates to our theoretical framework. In the model there are two types of entrepreneurs, slaves and non-slaveowners, each with potentially different costs of production and collateral due to slave wealth. Then, by looking at differences in business formation between both groups, we estimate the average potential "advantage" of a slaveowner. When using slave wealth, on the other hand, we can directly compare the effect of wealth with different liquidities, which directly relates to the collateral channel and the supplier's valuation of pledgeable assets. However, one could think of a similar model where instead what matters is the fraction of slave wealth over total wealth, and there is a distribution of individuals with different fractions of slave wealth. Due to the nature of our data, where there is a large number of non-slaveowners, we have decided to move away from this alternative model. Nevertheless, in the Appendix we show regression results with the fraction of slave wealth, and the results are qualitatively and quantitatively similar.[31]

5.4 Mechanisms

In this final subsection we provide evidence that the collateral mechanism, and not the cost of production, is the mediating factor behind the observed empirical relation between slave wealth and business formation. Our argument relies on two pieces of evidence. First, we examine the prediction in the model that if slaveowners have a relative advantage in using coercion to gain a cost of production advantage, then slaveowners are more likely to exit following abolition of slavery. We do not, however, observe this empirically. Second, we directly analyze empirical patterns in the Maryland labor market to argue that abolition is unlikely to have disrupted the labor market equilibrium. We conclude this after observing that wages did not significantly change in the first years following abolition. We also show in the appendix that the slaves rental market was active even during the Civil War, which suggests that ownership of slaves was not necessary to obtain the productive advantages of slave labor.

5.4.1 Slave wealth and exit

One of the insights from our theoretical framework is that if entrepreneurs have a relative advantage in coercing slaves to lower their cost of production, then we should observe a higher rate of exit among slaveowners after abolition of slavery. Recall that exiting is a dominant

[30] Counties in South Maryland are: Anne Arundel, Prince George, Montgomery, Charles, Calvert, and St. Mary's.

[31] In addition to this exercise, and to deal with other functional form assumptions, we also show that our main result is robust to probit specifications.

strategy for a set of former slaveowner entrepreneurs in our framework because completing the set of tasks necessary to run the business becomes too costly after abolition as coerced slaves are no longer available to the slaveowner.

To test for whether slave property rights provided a cost of production advantage, we restrict attention to businesses that were operating when abolition of slavery passed in Maryland. We define a business as operating at this time if (1) the date of its first report is before November of 1864, and (2) the date of its last report is after November 1864. There are a total of 327 businesses operating at the time of abolition. Then, we ran regressions similar to equation (1), but replacing the dependent variable for an indicator function that takes the value of one if the date of last report is somewhere between November of 1864 and December of 1865. The idea here is that, as the date of last report is highly correlated with exit, we should observe that slaveowners are more likely to have a last report following abolition if the cost of production channel is active. Approximately 11 percent of operating businesses have a last report in this window of time. The decision to look only for one year within abolition is arbitrary, but we have experimented with other windows of time and results are similar.

Table 7 presents regression results from this exercises using the same table taxonomy we have been using throughout our analysis. Panel A shows that there is no statistically significant relationship between being a slaveowner and exiting following abolition. In fact, if anything, slaveowners are *less* likely to exit during this time period. Importantly, note that we are controlling for non-slave wealth, so this result cannot be attributed to the fact that slaveowners have more non-slave wealth. In that sense, the negative coefficient on non-slave wealth is reassuring that this is a relevant control, as it also was when we studied business formation. Panel B uses slave wealth and results are similar. To get a sense of the magnitude of these coefficients, consider a one standard deviation increase in slave wealth, which in this case corresponds to 1. Then, exit *decreases* by only 4 percent following abolition. This means that estimates are a fairly precise zero and we can safely conclude that there are no differential exit rates between slave and non-slaveowner entrepreneurs within one year of abolition.

Overall, using the insights gained from the model, we can take both the business formation and exit results to conclude that the collateral mechanism is more likely to be the main channel at work. Although we acknowledge that analyzing differential rates of exit is by no means a perfect test of a lower cost of production, we believe this is suggestive evidence of the collateral mechanism being relatively more important. To complement this evidence, we now turn to examine the labor market in Maryland before and after abolition to provide further evidence of the relative importance of mechanisms linking slave wealth, credit access, and business formation in Maryland.

5.4.2 Wages

We next examine the labor market in Maryland to complement our evidence that the cost of production was not a relevant channel through which slave wealth affected business forma-

tion. In particular, we study how wages changed before and after abolition using a sample of workers from the Weeks report (Weeks 1886, Meyer 2004). The data include white male and female workers in Maryland. We normalize wages to be expressed in daily units.

To analyze the evolution of wages over time, we regress log daily wage on a gender indicator, a child indicator, city fixed effects, and year fixed effects. We restrict our analysis to the years after 1855 and report the coefficients for the year fixed effects in Figure 6. As can be seen, we find no significant changes in the first years after abolition. This evidence suggests that abolition did not significantly change the labor market equilibrium.

A potential explanation for this pattern of unaltered wages is that these (former) slaves were already working for market wages prior to abolition. If this was the case, the supply of workers seeking wages should have remained unchanged after abolition, hence, leaving the equilibrium wage unaffected. To support this argument, we show in the Appendix that the slaves rental market remained active throughout the Civil War in the neighboring state of Virginia.[32] We also show that there was no significant trend in the monthly rental rates of slaves, suggesting a stable labor market equilibrium despite the ongoing Civil War. All together, we interpret these findings as additional evidence that the collateral channel was how slave wealth affected business formation. That is, ownership of slaves was not necessary to obtain the productive advantages of slave labor.

6 Conclusion

This paper explores a new dimension of the economic effects of slavery. While most of the economic literature has focused on slaves as labor force, we explore how slave wealth facilitated business start-ups through their role as liquid and mobile collateral assets.

We propose a simple model of business entry and exit decisions of credit-constrained entrepreneurs for the purpose of guiding the interpretation of our empirical results. In the model, slave wealth is allowed to play two roles: 1) slaves as a source of coerced labor force (cost of production channel), and 2) slaves as a better, more liquid collateral (collateral channel). This second channel is based on the premise that while two assets may have similar "fundamental" values, their relative resale price (or, the lenders' preference towards these assets) will be a function of the liquidity of these assets. The three main theoretical predictions are that if either or both channels were active then the likelihood of a slaveowner obtaining start-up funding is greater than that of an equally-wealthy non-slaveowner, that this advantage disappears post-abolition, and that slaveowners are more likely to exit post-abolition only if the cost of production channel is active.

Our main empirical result is that entrepreneurs with more slave wealth were more likely to

[32]For this exercise we use data on slave rental rates from Fogel and Engerman (1976a). Unfortunately, the data for Maryland only include information for one county with no records after 1855. For this reason, we use data for Virginia instead.

enter into the market than equally-wealthy entrepreneurs with other types of wealth, suggesting that wealth composition and wealth liquidity were relevant factors behind business start-ups. We find that this relationship disappears post-abolition, suggesting that slave wealth, as opposed to unobserved characteristics of former slaveowners, is what drives this result. Our secondary empirical result is that we find no evidence of slaveowner entrepreneurs exiting the market with a higher probability after abolition (all else equal). Armed with the predictions of the model, we argue that these empirical results are consistent with credit being the primary channel through which slave wealth affected business formation.

Our results are relevant for many debates around slavery. If slaves were in fact experiencing frequent trading, then the human costs of family separation loom much larger in the costs borne by African Americans under slavery. Indeed, Upper South slaves likely lived in heightened fear of forced sale to the Deep South when their owners were highly indebted. Foreclosures and court-ordered sales may also suggest new margins of long-term persistence via family structure and social capital, as slaves may have been reshuffled too frequently for relationships to form. The financial dimension of slavery also adds a new dimension to the costs of the Civil War and the long period of subsequent economic backwardness experienced in the postbellum South. Slaveowners lost not just the war and the extra hours of uncompensated black toil, but also their primary store of value, and assessing the long-term damage wreaked by emancipation on Southern balance sheets may be a useful direction for future research.[33]

Finally, our results emphasize that slave property rights were relevant to much more than plantation agriculture alone. Maryland, economically much closer to the free states than the slave states, still made use of slaves in ways that were complementary to modern, industrial activities. While slaves employed in industry were likely still rare, the role slaves played as collateral suggests that slaves may have been pledged in even more complex and extensive financial contracts, extending onto the balance sheets of Northern institutions. Slavery had economic consequences far beyond plantation agriculture, and may be a larger contributor to national economic development than previously thought.

[33] A Brazilian analogue can be found in Schulz (2008), who describes the effects of abolition in Brazil on credit and money supply, arguing that the government inflated the economy and allowed loose financial regulation for rural banks as a way to placate the slaveowners after abolition.

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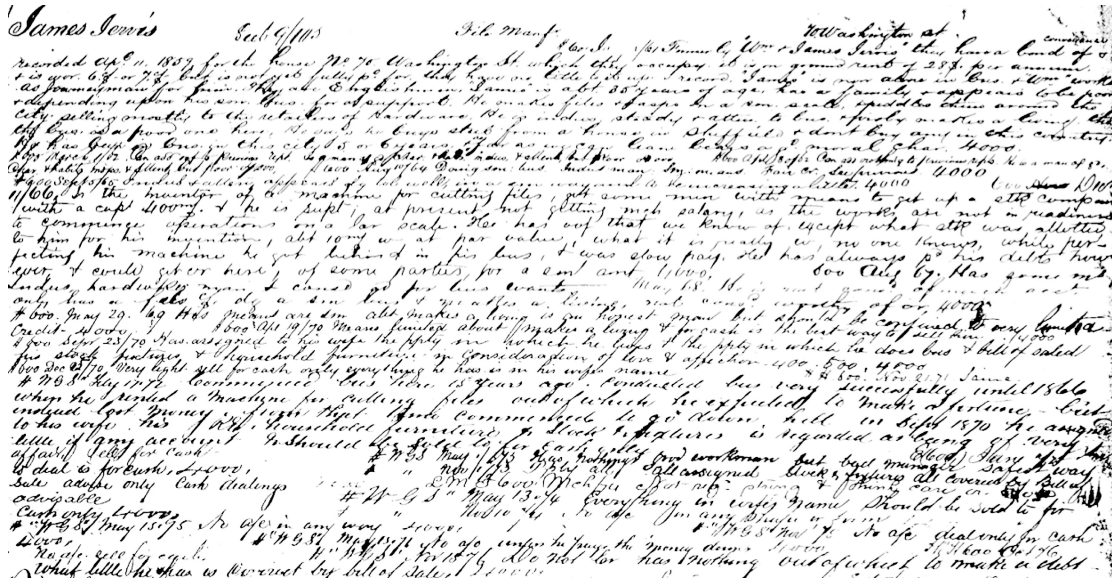
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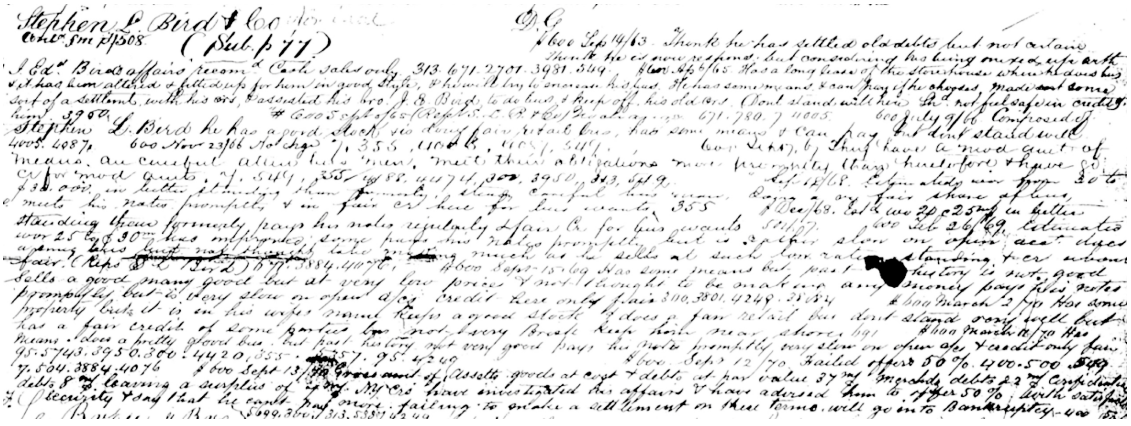
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Figure 1: Reports

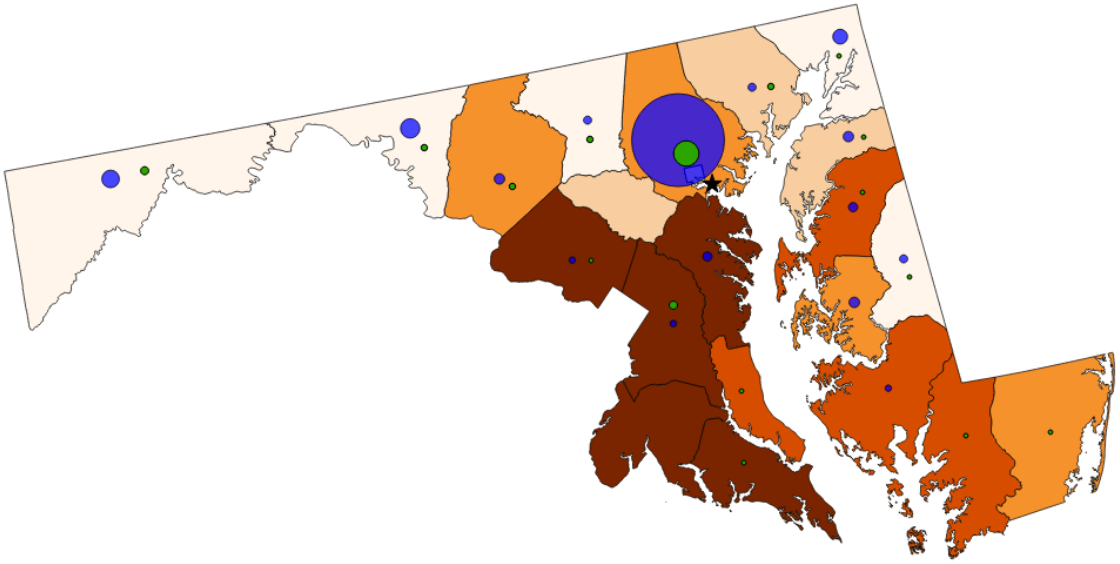


A. James Jervis, classified as non-slaveowner in 1860, owned a manufacturing store in Baltimore. His first report is from January of 1861 and his last report is from November of 1876.



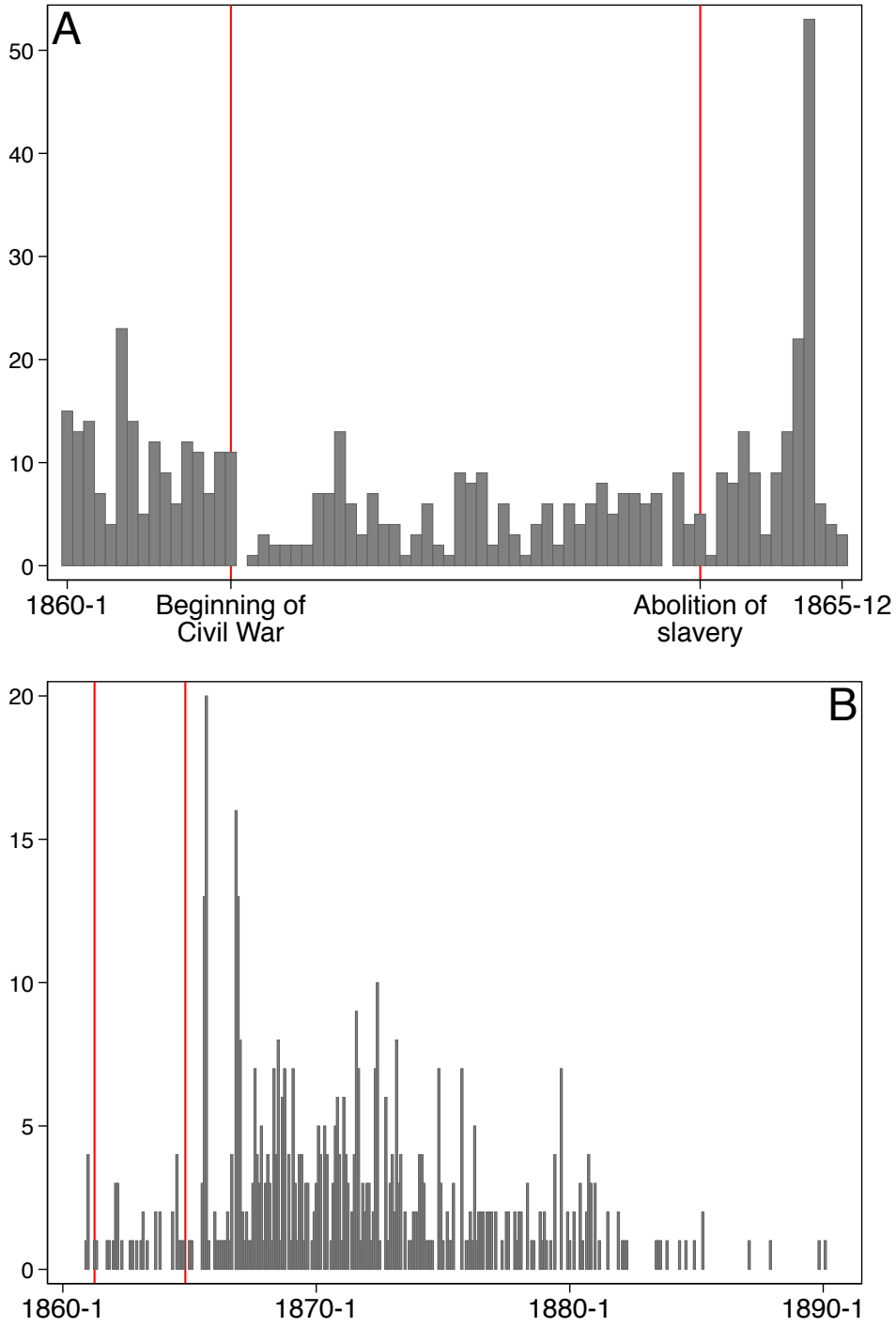
B. Stephen L. Bird, classified as slaveowner in 1860, owned a dry goods store in Baltimore. His first report is from September of 1863 and his last report is from September of 1870.

Figure 2: Location of entrepreneurs and slaves



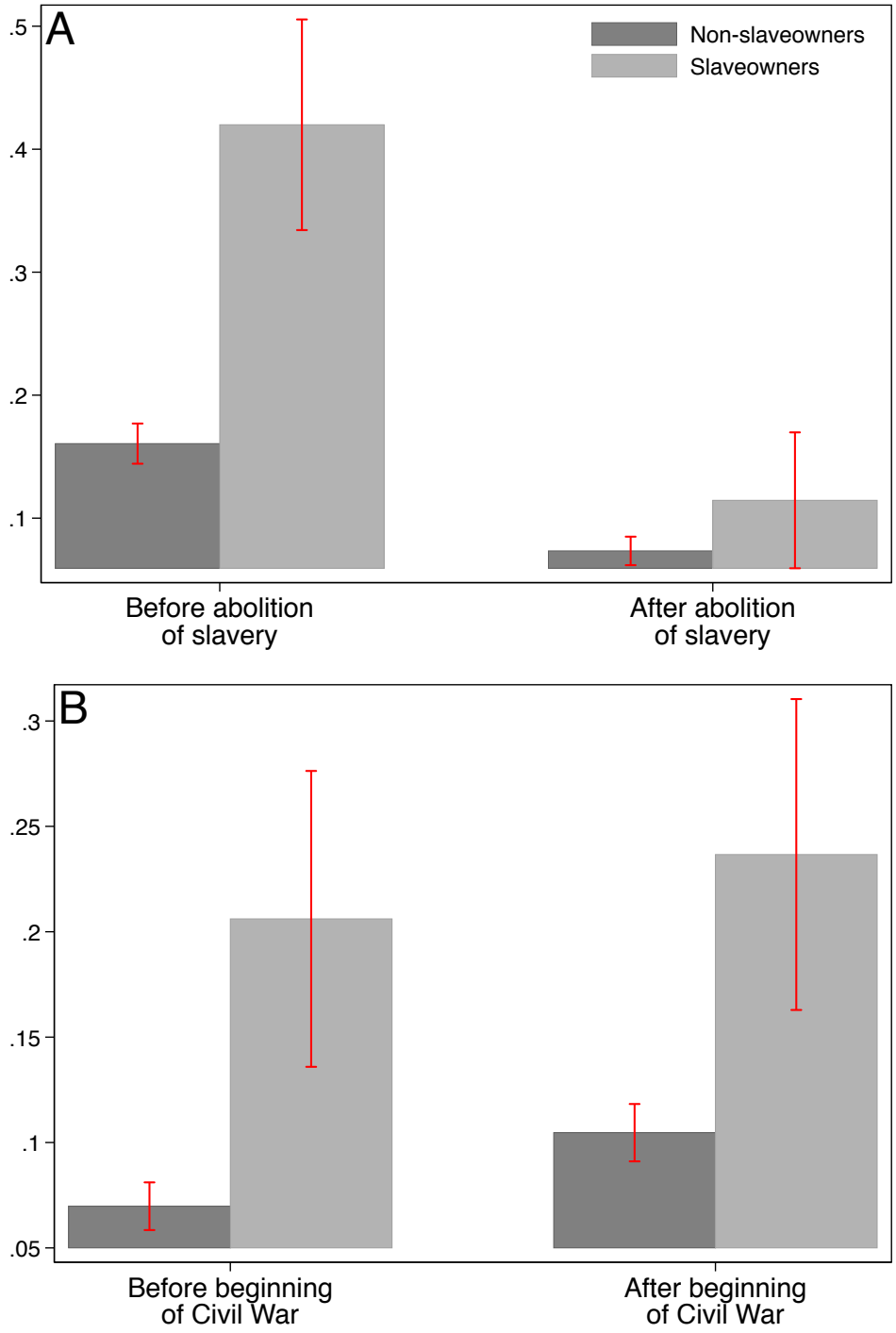
Notes: This map shows the location of slaveowner (green) and non-slaveowner (blue) entrepreneurs in our dataset. The size of circles represents the relative number of them. Most entrepreneurs ($\sim$ 80%) are located in Baltimore, which is marked with ★. In addition, counties with darkers colors had more slaves than counties with lighter colors. The number of slaves comes from the 1860 Slave Schedules and entrepreneurs are our own construction.

Figure 3: Business entry and exit



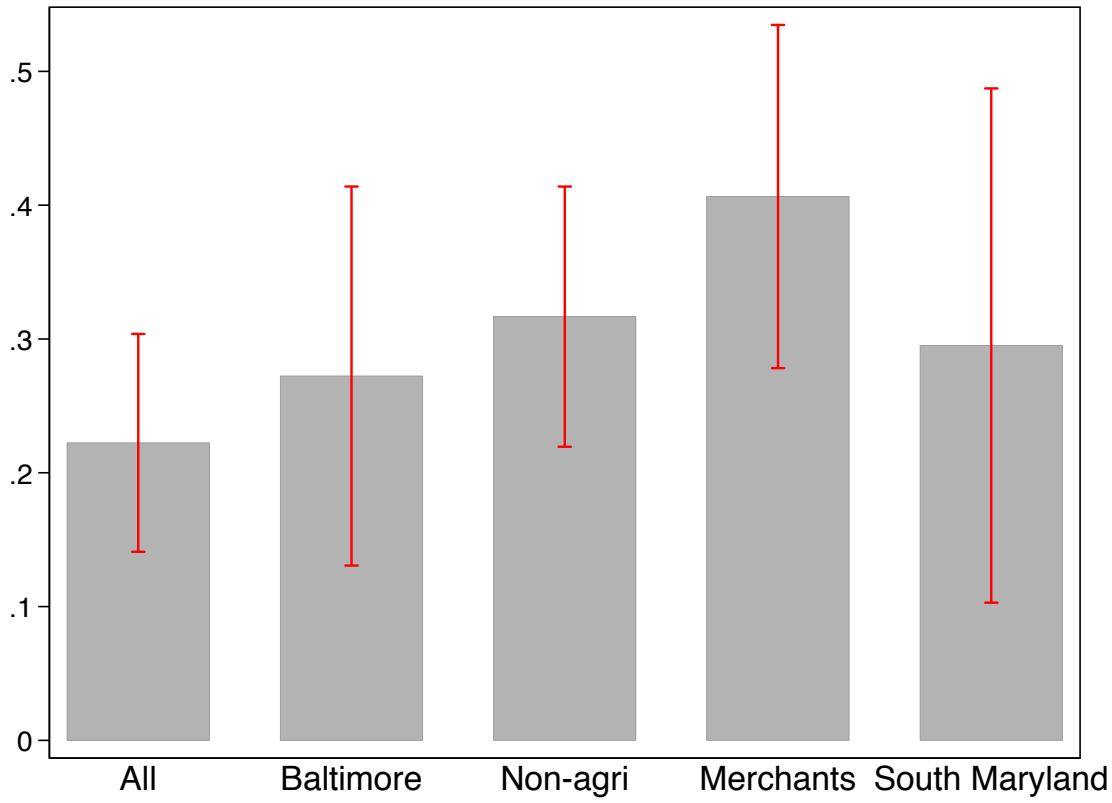
Notes: Panel A shows the number of businesses that entered between January 1860 and December 1865. The Civil War started in April 1861 and abolition of slavery occurred in November 1864. Panel B shows the number of businesses that exited by month between January 1860 and December 1890.

Figure 4: Probability of business entry



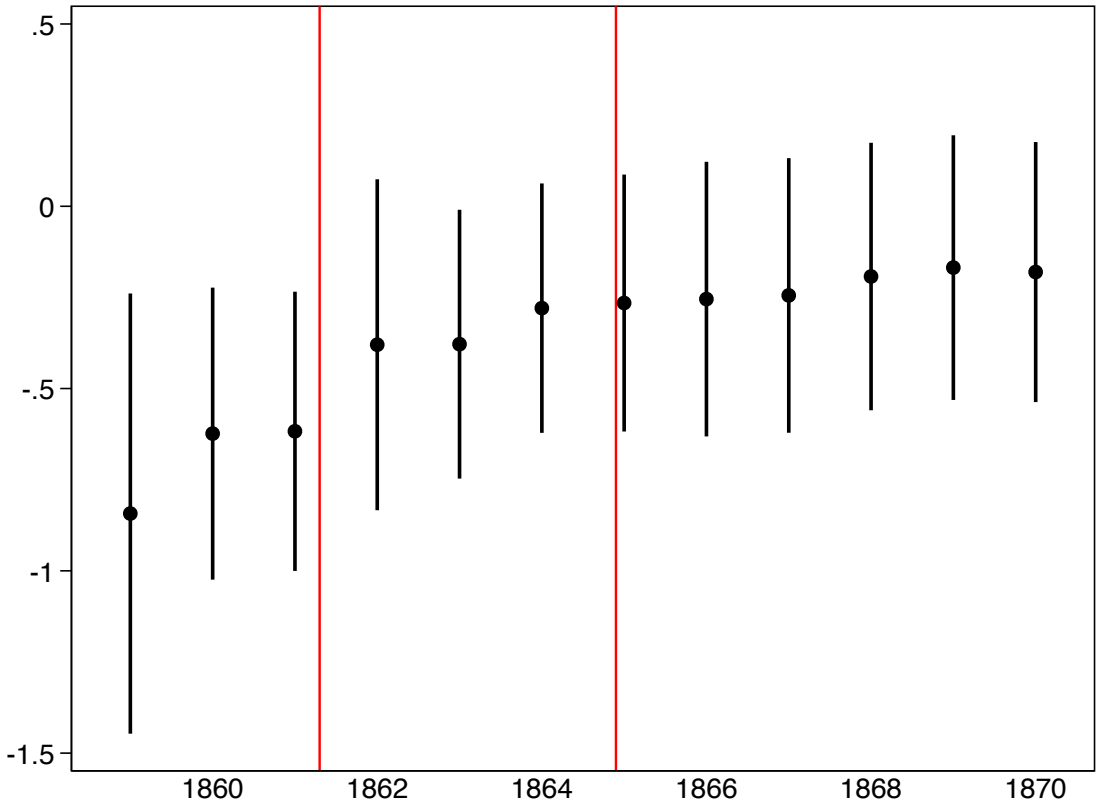
Notes: Panel A shows the probability of business entry before and after abolition of slavery in Maryland in November of 1864, by slaveownership status. Panel B shows the same probability but before and after the beginning of the Civil War in April of 1861 (and before abolition of slavery).

Figure 5: Sub-samples



Notes: This figure shows the differential rates of business formation between slave and non-slave entrepreneurs in (from left to right) Maryland, restricting attention to Baltimore, non-agricultural businesses, merchants, and South Maryland.

Figure 6: Evolution of wages in Maryland



Notes: We report coefficients on year fixed effects from a regression of log daily wages in Maryland on gender, age, city, and year fixed effects using data from Meyer (2004).

Table 1: Descriptive statistics

	Maryland	*Entrepreneurs*	*Difference*
	(1)	(2)	(3)
Individuals			
Log non-slave wealth	2.93	6.23	3.30***
	(3.56)	(3.90)	(0.18)
Log personal wealth	2.45	5.57	3.12***
	(3.11)	(3.71)	(0.17)
Log real estate wealth	1.73	3.43	1.70***
	(3.27)	(4.34)	(0.18)
Indicator illiterate	0.06	0.01	-0.05***
	(0.24)	(0.09)	(0.01)
Age	33.08	38.44	-5.36***
	(14.62)	(11.28)	(0.70)
Indicator Baltimore	0.44	0.79	0.35***
	(0.50)	(0.40)	(0.02)
Indicator agro-business	0.25	0.04	-0.21***
	(0.44)	(0.20)	(0.02)
Merchant	0.25	0.56	-0.31***
	(0.43)	(0.50)	(0.03)
Slave wealth			
Slaveowner	0.04	0.13	0.09***
	(0.19)	(0.34)	(0.01)
Log slave wealth	0.34	1.04	0.70***
	(1.69)	(2.66)	(0.10)
Individuals	1,554	526	2,080

Notes: Maryland representative sample from IPUMS 1% sample. Entrepreneurs is our construction from the R.G. Dun & Company Collection. Slave wealth was calculated using the number of slaves and the price for a 25 year-old male slave in Maryland in 1860 (Fogel and Engerman, 1976).

Table 2: Slave wealth and entry

Dependent variable is an indicator for first report before abolition of slavery

	All		*Baltimore*	*Non-agri*	*Merchants*
	(1)	(2)	(3)	(4)	(5)
Panel A					
Slaveowner	0.259***	0.171***	0.227***	0.254***	0.338***
	(0.044)	(0.041)	(0.073)	(0.048)	(0.067)
Log non-slave wealth		0.029***	0.033***	0.038***	0.041***
		(0.003)	(0.004)	(0.003)	(0.007)
Panel B					
Log slave wealth	0.029***	0.032***	0.036***	0.041***	0.051***
	(0.005)	(0.005)	(0.009)	(0.006)	(0.009)
Log personal wealth		0.037***	0.036***	0.040***	0.038***
		(0.004)	(0.005)	(0.004)	(0.007)
Log real estate wealth		-0.005	0.004	0.004	0.006
		(0.003)	(0.005)	(0.004)	(0.007)
Mean of dep. variable	0.176	0.176	0.251	0.212	0.369
Human capital controls	No	Yes	Yes	Yes	Yes
Individuals	2,080	2,080	1,109	1,663	493

Notes: Human capital controls include an indicator variable for illiterate individuals, age, and age squared. Robust standard errors are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3: Entry before the Civil War

Dependent variable is an indicator for first report before the Civil War

	All		*Baltimore*	*Non-agri*	*Merchants*
	(1)	(2)	(3)	(4)	(5)
Panel A					
Slaveowner	0.136***	0.089**	0.039	0.118***	0.164**
	(0.036)	(0.035)	(0.059)	(0.045)	(0.077)
Log non-slave wealth		0.015***	0.016***	0.019***	0.022***
		(0.002)	(0.003)	(0.003)	(0.006)
Panel B					
Log slave wealth	0.015***	0.016***	0.008	0.018***	0.026***
	(0.004)	(0.004)	(0.008)	(0.006)	(0.009)
Log personal wealth		0.016***	0.015***	0.017***	0.021***
		(0.003)	(0.004)	(0.003)	(0.006)
Log real estate wealth		0.001	0.005	0.006	0.001
		(0.003)	(0.004)	(0.003)	(0.006)
Mean of dep. variable	0.078	0.078	0.101	0.093	0.168
Human capital controls	No	Yes	Yes	Yes	Yes
Individuals	2,080	2,080	1,109	1,663	493

Notes: Human capital controls include an indicator variable for illiterate individuals, age, and age squared. Robust standard errors are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: Entry during the Civil War

Dependent variable is an indicator for first report during the Civil War

	All		*Baltimore*	*Non-agri*	*Merchants*
	(1)	(2)	(3)	(4)	(5)
Panel A					
Slaveowner	0.132***	0.082**	0.152**	0.118**	0.158**
	(0.038)	(0.037)	(0.074)	(0.048)	(0.080)
Log non-slave wealth		0.016***	0.020***	0.022***	0.025***
		(0.003)	(0.004)	(0.003)	(0.006)
Panel B					
Log slave wealth	0.014***	0.018***	0.025***	0.021***	0.024**
	(0.004)	(0.004)	(0.009)	(0.006)	(0.010)
Log personal wealth		0.024***	0.025***	0.027***	0.022***
		(0.003)	(0.004)	(0.004)	(0.007)
Log real estate wealth		-0.006**	-0.001	-0.002	0.007
		(0.003)	(0.004)	(0.004)	(0.006)
Mean of dep. variable	0.112	0.112	0.170	0.137	0.225
Human capital controls	No	Yes	Yes	Yes	Yes
Individuals	2,080	2,080	1,109	1,663	493

Notes: Human capital controls include an indicator variable for illiterate individuals, age, and age squared. Robust standard errors are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5: Entry by year

Dependent variable is an indicator for entry in year X

	1860	1861	1862	1863	1864	1865	1860–1863	1864–1865
Panel A								
Slaveowner	0.088***	0.038*	0.021	0.012	0.007	0.018	0.159***	0.025
	(0.034)	(0.023)	(0.021)	(0.021)	(0.019)	(0.030)	(0.041)	(0.034)
Log non-slave wealth	0.013***	0.004***	0.005***	0.004***	0.003*	0.007***	0.026***	0.010***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.002)
Panel B								
Log slave wealth	0.014***	0.006**	0.005*	0.004*	0.002	0.005	0.029***	0.007*
	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.005)	(0.004)
Log personal wealth	0.013***	0.005***	0.008***	0.007***	0.005**	0.009***	0.032***	0.014***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.003)
Log real estate wealth	0.002	0.000	-0.001	-0.003*	-0.002	-0.002	-0.002	-0.004
	(0.003)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Mean of dep. variable	0.064	0.028	0.027	0.029	0.031	0.073	0.149	0.104
Human capital controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individuals	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080

Notes: Human capital controls include an indicator variable for illiterate individuals, age, and age squared. Robust standard errors are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6: Entry after abolition

Dependent variable is an indicator for entry after abolition

	All		*Baltimore*	*Non-agri*	*Merchants*
	(1)	(2)	(3)	(4)	(5)
Panel A					
Slaveowner	0.041	0.014	0.097	0.026	-0.078
	(0.028)	(0.030)	(0.069)	(0.040)	(0.050)
Log non-slave wealth		0.008***	0.011***	0.010***	0.016***
		(0.002)	(0.003)	(0.003)	(0.005)
Panel B					
Log slave wealth	0.004	0.004	0.012	0.005	-0.006
	(0.003)	(0.003)	(0.008)	(0.005)	(0.007)
Log personal wealth		0.010***	0.009**	0.009***	0.013**
		(0.003)	(0.004)	(0.003)	(0.005)
Log real estate wealth		-0.002	0.005	0.000	0.004
		(0.002)	(0.004)	(0.003)	(0.005)
Mean of dep. variable	0.076	0.076	0.126	0.091	0.118
Human capital controls	No	Yes	Yes	Yes	Yes
Individuals	2,080	2,080	1,109	1,663	493

Notes: Human capital controls include an indicator variable for illiterate individuals, age, and age squared. Robust standard errors are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7: Exit following abolition

Dependent variable is an indicator for exit within 12 months within abolition

	All		*Baltimore*	*Non-agri*	*Merchants*
	(1)	(2)	(3)	(4)	(5)
Panel A					
Slaveowner	-0.049	-0.024	-0.025	-0.023	-0.049
	(0.044)	(0.044)	(0.059)	(0.046)	(0.054)
Log non-slave wealth		-0.013**	-0.012*	-0.013**	-0.011
		(0.006)	(0.007)	(0.006)	(0.008)
Panel B					
Log slave wealth	-0.007	-0.005	-0.005	-0.005	-0.007
	(0.005)	(0.005)	(0.007)	(0.006)	(0.007)
Log personal wealth		-0.005	-0.004	-0.006	-0.006
		(0.006)	(0.007)	(0.006)	(0.007)
Log real estate wealth		-0.008**	-0.010**	-0.008*	-0.006
		(0.004)	(0.005)	(0.004)	(0.006)
Mean of dep. variable	0.110	0.110	0.129	0.114	0.088
Controls	No	Yes	Yes	Yes	Yes
Entrepreneurs	327	327	255	315	155

Notes: Controls include a set of human capital controls (an indicator variable for illiterate individuals, age, and age squared) and the logarithm of months since the first report (proxy for duration pre-abolition). Robust standard errors are reported in parentheses. Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.