Finance and the Slave Trade*

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Abstract:

To what extent did access to outside finance contribute to the forced displacement of at least 10.6 million Africans to the Americas between 1540 and 1860? Like other Europeans, Dutch planters in the Caribbean pledged their plantations, including the enslaved, as collateral to obtain credit. We study the effects of an exogenous increase in Dutch plantation credit in the 1760s. Using colony and plantation-level variation, we show that planters used this additional credit to import more enslaved. Increased Dutch imports were not offset by lower imports by other Europeans. We estimate that the additional credit increased total imports by 17%.

Keywords: Transatlantic Slave Trade, Credit Constraints, Collateral
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Between 1540 and 1860, at least 10.6 million enslaved Africans were forcibly displaced to the Americas, the majority during the 18th century, and more than half ending up on Caribbean plantations.[1] The transatlantic slave trade had important economic and societal consequences, not just in the Americas, but also in Africa, where it led to institutional decline and development traps, and in Europe, where it provided capital for the Industrial Revolution.[2] For several decades, the economic reasons for slavery in the Americas have been hotly debated, mostly focusing on labor productivity and economies of scale. Large-scale coercion and better resistance to tropical diseases made enslaved African labor arguably more productive than European free or indentured labor.[3] Comparatively little attention has been paid to financial-economic factors. Contrary to conventional wisdom, enslaved labor was not "cheap;" for example, it accounted for 40-50% of the appraised value of a typical plantation in the Dutch Caribbean in the 1760s. This meant there were significant costs in starting a plantation and expanding its enslaved labor force. Secure property rights enabled planters to pledge the valuable enslaved labor as collateral to secure external loans. This raises the question: to what degree did outside finance contribute to the forced displacement of Africans to the Americas?

Existing historical work documents that European credit markets played a central role in the Caribbean plantation system. Most recently, Radburn (2015, 2023) shows the importance of short-term funding through bills of exchange, discounted in the British credit market, while De Jong, Kooijmans and Koudijs (2023, 2025) document the significance of plantation mortgage-backed securities (MBS) sold in the Dutch market. However, there is limited work examining to what degree outside finance contributed to plantation growth and the import of enslaved people. Answering this question is challenging; a contemporaneous increase in credit and slave imports does not necessarily imply a causal relation Credit is likely endogenous to economic conditions, and demand for enslaved labor may have driven credit expansion rather than the reverse. Moreover, outside credit may have merely substituted for internal equity – retained earnings or family wealth – leaving the total volume of slave imports unchanged.

[1] https://www.slavevoyages.org/

[2] E.g. Williams (1944); Inikori (1992); Engerman and Sokoloff (1997, 2002); Nunn (2008); Nunn and Wantchekon (2011); Açemoglu, García-Jimeno and Robinson (2012); Robinson and Açemoglu (2012); Heblich, Redding and Voth (2022); Berg and Hudson (2023).

[3] E.g. Curtin (1969); Fogel and Engerman (1974, 1977); Fenoaltea (1984); Steckel (1986); Fogel (1989); Wright (2006); Açemoglu and Wolitzky (2011); Hilt (2020). For recent empirical work see Bobonis and Morrow (2014); Dippel, Greif and Trefler (2020); Esposito (2022); Salah (2024).

In this paper, we study the effects of an exogenous shock to the supply of credit in the Dutch Caribbean on the imports of enslaved people. In the 1750s, after years of heavy borrowing to fight international wars, the Dutch Republic started to repay its sizeable debt and banks stepped in to facilitate the issuance of alternative guilder denominated assets. As a result, substantial amounts flowed into plantation MBS, leading to an exogenous increase in the availability of credit for plantations in the Dutch Caribbean. Planters pledged their plantations, including the enslaved labor, as collateral to obtain large sums of secured credit, which they could use to purchase more enslaved.

We use two sources of macro-economic variation to investigate the effects of this exogenous Dutch credit boom on the import of enslaved. First, for institutional reasons, the Dutch colony Suriname always had access to the deep Amsterdam credit market, while the nearby Dutch colony Demerara-Essequibo only obtained access in 1771. For the period up to 1770, we can therefore compare these two colonies to tease out the effect of the credit boom. Second, we can compare the two Dutch colonies in the 1760s and 1770s against similar British and French plantation colonies that did not gain access to plantation funding in Amsterdam.[4] We find that credit availability led to substantially more slave imports.

These findings are supported by micro-level evidence. Using detailed data at the plantation level, we show that plantations' slave imports grew substantially after obtaining a mortgage, suggesting that mortgage credit was a significant factor behind the imports of enslaved. We use two sources of exogenous variation in individual plantations' access to credit to estimate causal effects. First, we look at a shock to mortgage refusals in 1770. Due to unfortunate timing in the boom, a subset of banks faced a sudden collapse of investor demand for plantation MBS and refused to fund mortgages that their colonial agents had already originated. Plantations that obtained mortgages from comparable non-refusing banks saw a differential increase in the number of enslaved. Second, we look at the staggered exit of banks from the colonial credit market after 1770. Plantations that lost access to credit earlier saw a differential decrease in the number of enslaved.

We calculate to what degree the abnormal level of credit over the period 1765-1771 led to additional slave imports. We use shocks to insurance premia as an exogenous supply shifter to estimate the

[4] There is no evidence for French plantations ever borrowing money in Amsterdam. British plantation owners only started doing so after 1773, when Parliament passed the British West Indies Estates Bill that gave secure collateral rights in the plantations to foreign (Dutch) creditors (Van der Voort 1973, p. 108).

demand elasticity for slave imports in order to take aggregate price effects into account. Our calculations suggest that the shock in credit availability increased slave imports by 17%.

Finally, we use data on slave shipments from different African ports to test whether the increase in Dutch imports caused by the credit boom was offset by lower imports by other European countries, which did not experience a comparable credit boom. We find no evidence for systematically offsetting effects. If other countries competed against Dutch traders in a given port, their imports from that port were lower during the boom years. However, this effect is statistically insignificant and washes out at the region or continent-level. Competing slave-importing countries were seemingly able to substitute with imports from other areas.

Although our evidence concerns the Dutch plantation system, our key findings likely extend to other European colonies in the Caribbean. Historical evidence suggests that credit was central in both the British and French plantation systems. The British used short-term credit in the form of bills of exchange and longer-term mortgages (Davies 1952; Checkland 1958; Pares 1960; Price 1991; Devine 1974; Eltis 2000, Smith 2002, 2006; Menard 2006; Radburn 2015, 2023). At the time, Adam Smith (1776, Vol II, p. 187) argued that "the stock [of capital] which has improved and cultivated the sugar colonies of England has, a great part of it, been sent out from England (…) owing to [its] great riches, of which a part has overflowed upon these colonies." For example, when the British took over the Windward Islands from the French after the Seven Years War in 1763, the sizeable imports of enslaved that followed went hand in hand with a strong credit expansion (Sheridan 1960, 1974; Murdoch 1984; Quintanilla 2004). Plantations in the French Caribbean colonies too, obtained credit from merchants in France, which were secured by formal plantation mortgages (Thesee 1972; Trouillot 1982; Forestier 2011), with Stein (1975) arguing that the French slave trade "depended on credit."

Our work builds on a small body of literature linking finance and slavery. There is work on the 19th century highlighting the role of enslaved as collateral in financial transactions. Wright (2006) argues that American slavery's defining feature was the system of secure property rights it provided to slave-owners over their enslaved.[5] Consistent with the descriptive evidence from the U.S. in Kilbourne (1995), Martin (2010), Rosenthal (2018) and Murphy (2023), this allowed the owners to

[5] Martins and Green (2025) provide a similar argument reviewing evidence from the U.S., Brazil and the British Cape Colony.

borrow substantial sums on the collateral of their enslaved. Koudijs and Salisbury (2020) and González, Marshall and Naidu (2017) provide (indirect) evidence that this facilitated investment in agricultural production and the start of new business ventures. The evidence in Martins (2025) suggests that enslaved were used as collateral in the British Cape Colony as well. However, because the Transatlantic slave trade was heavily restricted after the British Slave Trade Act of 1807, this work has ultimately little to say about the link between outside finance and slave imports from Africa. Radburn (2015) provides a mix of quantitative and qualitative evidence from the second half of the 18th century that British slave shipments to Jamaica and North America increased when credit conditions in colonies closer to Africa deteriorated, suggesting that local credit conditions shaped the direction (and by extension, possibly the volume) of the British slave trade. We contribute to this literature by providing direct causal evidence that external finance substantially increased slave imports from Africa.

The paper is structured as follows. Sections I and II discuss the relevant historical background and macro-economic trends. Sections III and IV provide colony- and plantation-level evidence linking credit extension to slave imports. Section V estimates aggregate effects. Section VI evaluates whether additional Dutch slave imports crowded out slave imports by other colonial powers. Section VII concludes. Additional material is in the Internet Appendix (IA).

I. Historical background

In this section, we provide historical background on the Caribbean plantation system and the role of credit in Dutch, British and French slave imports. We also discuss the Dutch boom in plantation credit driven by plantation MBS. Internet Appendix, Section A has a map with the location of all relevant Caribbean colonies.

A. Caribbean slave plantations and the role of credit

A.1. Suriname

Suriname was the largest Dutch plantation colony in the Caribbean. It relied on the exploitation of enslaved labor from Africa to primarily produce sugar and coffee. Plantation size was substantial; sugar plantations had an average size of about 750 acres and 150 enslaved (and included large mills and cooking houses); coffee plantations had an average size of about 250 acres and 120 enslaved (Van Stipriaan 1993: p. 54, 104).

Property rights, well-established under the Dutch legal system, were secure, facilitating credit relations between plantations and merchant banks in the Dutch Republic. Plantations typically committed all their crop to be sold by a particular merchant bank. This gave them access to short-term credit, paying for imported enslaved and various inputs with bills of exchange written on the merchant bank. Plantations also obtained long-term mortgages through the intermediation of the same merchant banks, for which the underlying collateral included all enslaved present on the plantation (including minors), the unimproved value of the land, all improvements (acres of sugar cane, coffee trees, cotton and cacao plants, levees, ditches, etc.) and buildings. The majority of merchant banks trading on Suriname were based in Amsterdam, the financial center of Europe at the time, while some other merchant banks operated from Rotterdam, Haarlem, and Middelburg.

A.2. Demerara-Essequibo

To the west of Suriname was Demerara-Essequibo, the second largest Dutch Caribbean colony in terms of number of plantations and slave imports, which primarily produced sugar and coffee as well. Initially, credit to Demerara-Essequibo was limited, because plantations did not have access to the deep Amsterdam capital markets. Formally, the colony was under management of the city of Middelburg, the capital of the Dutch province of Zeeland, that, for mercantilist reasons, mandated all plantation production to be shipped to its own port. This excluded the Amsterdam merchant banks, who were unwilling to provide credit to plantations without the security of incoming sugar and coffee shipments (Van der Voort 1973, p. 129). Because Amsterdam's capital markets were much deeper than Middelburg's, credit to the colony was effectively restricted.

Credit from Amsterdam started to flow more freely into Demerara-Essequibo after 1770 (Hoonhout 2020, pp. 140-141). Amsterdam and Middelburg had been in conflict about the management of the colony going back to 1750. When negotiations broke down, Stadtholder Willem V, as the highest-ranking impartial magistrate, was appointed as arbiter in 1770. The compromise he proposed, implemented in January 1771, formally opened up trade between Demerara-Essequibo and the rest of the Dutch Republic, but with binding restrictions: Middelburg retained the right to send the first 16 ships to the colony each year (Van der Voort 1973, p. 124-134; Paesie 2010, p. 299). Amsterdam sent the stadtholder a formal complaint indicating that no more than 10 ships had ever been sent in

a single year (1768), meaning that Middelburg would effectively keep its monopoly.[6] However, Amsterdam carefully studied the small print and found a loophole. Middelburg had to publicly announce the ships it was planning to send each year by March 15 and this proved infeasible. When Middelburg failed to provide a final list by spring 1771, Amsterdam jumped at the occasion and sent its first ship to the colony in August.[7] In response, the rules were revised in 1772. However, the tide had definitely turned and Demerara-Essequibo remained open to Amsterdam merchant banks. Between 1770 and 1779, Amsterdam and Middelburg sent about the same number of ships to Demerara-Essequibo (Van der Oest 2003, p. 342). This gave the colony's plantations access to Amsterdam credit.[8]

A.3. Dutch shipments of enslaved

During our period from 1750 to 1780, the forced shipment of African people to Suriname and other Dutch colonies was done by private companies. We have detailed information on the shipments of two large slave traders: the Middelburgsche Commercie Compagnie (MCC) and Coopstad & Rochussen, jointly covering about 30% of all slave voyages to Suriname during our period.

Typically, plantations purchased the enslaved using bills of exchange drawn on their merchant banks. If the plantations did not have a positive balance (which was often the case), their banks would make these payments against the (mortgage) credit they had provided.

A.4. Colonies managed by other countries

Credit appears to have played an important role in the rest of the Caribbean as well, especially in the British and French colonies. Pares (1960) and Price (1991) document the importance of British short-term credit. Bills of exchange, often with maturities of around one year played a key role; initially extended by bankers, they were later discounted in the market and eventually held by investors (Radburn 2015, p. 668). Due to their short maturities, bills of exchange created a maturity mismatch between planters' liabilities and assets (Goodspeed 2016, p. 14) and British mortgage

[6] Zeeland Archives, Collection Van Citters (105), 20 Request of certain Amsterdam merchants, etc., 1771. Between 1760 and 1769, an average of 7 ships had set sail each year. This would grow to 15 between 1770 and 1779 (Van der Oest 2003, p. 342).

[7] National Archives Kew, Colonial Office, British Guiana, etc., Dutch Association Papers 1772-1773 (116/38), Letter WIC Amsterdam to Governor Storm van 's Gravesande, August 6, 1771; Dutch National Archives, Van de Spiegel etc. (3.01.26), inv. nr. 451.

[8] Before 1770 only a single Amsterdam banker was active in Demerary-Essequibo; afterwards, this number grew to five (Hoonhout 2020, p. 141). One Middelburg banker also substantially expanded its mortgage business in 1772, but more than 75% of this expansion was funded through an Amsterdam banker (Van der Voort 1973, p. 105).

lending was common as well (Smith 2002, 2006). Devine (1974, p. 116) argues that bills of exchange, as "the lifeblood of Atlantic commerce", were vital for the Glasgow tobacco trade in the 18th century.[9] Radburn (2015) provides a mix of qualitative and quantitative evidence that slave shipments to Jamaica and North America, the final stops of a typical British slave voyage, increased when credit conditions deteriorated in colonies closer to Africa. This suggests that the distribution of enslaved over different British colonies depended on local credit conditions.

The use of credit was also ubiquitous in the French colonies. Trouillot (1982) describes the widespread use of credit in coffee production in Saint Domingue. Thesee (1972) and Forestier (2011) describe the activities of French merchant banks in Bordeaux and Nantes, which were similar to those of their Dutch counterparts. They would advance money to planters for the expansion of plantations, purchase of enslaved, and various inputs in return for shipping privileges and exclusive sales rights in France. Loans frequently involved mortgage clauses, giving the merchant banks recourse to seize the estate if the planter defaulted. The merchant banks also helped plantations to raise capital in French financial markets more widely. In 1776, France established the *Caisse d'Escompte*, essentially a public discount bank, which began discounting colonial bills of exchange. By 1788, the Caisse and many private banks held a significant volume of colonial paper (Plessis 1989). Stein (1975) argues that the French slave trade "depended on credit."

B. Plantation MBS

B.1. The development and boom in plantation MBS

In the 1750s, after years of heavy borrowing to fight international wars, the Dutch Republic started to repay its sizeable debt, causing government bond yields to fall and investors to seek other investments. At the same time, merchant banks had extended significant credit to the planters in Suriname and they sought ways to tap the deep Dutch capital market to sustain the credit growth to the slave plantations. In 1753, Amsterdam merchant bank Deutz & Co, managed by an Amsterdam burgomaster, underwrote bonds backed with plantation mortgages and sold them to investors. Other merchant banks followed and issued many more plantation mortgage-backed securities (MBS), especially after 1765 when the Dutch government increased its debt repayment.

[9] Because of their relatively short maturity, they also created a maturity mismatch between planters' liabilities and assets (Goodspeed 2016, p. 14).

Plantation MBS could be on a pool of mortgages or on a (large) individual mortgage. The industry standard was for banks to limit the mortgage sum to 5/8 of the appraised plantation value. The first ten years of the mortgage were usually interest-only. During the subsequent ten years, the mortgage had to be paid down. However, in practice, most plantations renewed their mortgage before that point. The typical mortgage interest rate was 6%, which was considerably higher than the government bond yield of around 2.5 to 3%. If plantation values grew, mortgages could be increased up to 5/8 of the newly appraised value, providing plantations with additional credit (Van de Voort 1973; Van Stipriaan 1993; Hoonhout 2012; De Jong, Kooijmans and Koudijs 2023).

The typical process of setting up a plantation MBS was as follows. In the Dutch Republic, merchant banks would first solicit interest from investors. Once they had an estimate of MBS demand, they would instruct their agents in Suriname to start originating mortgages, which had to adhere to certain minimum requirements, up to a certain amount. Once originated, the agent would send the mortgage contracts and corresponding paperwork, such as the plantation appraisal report, to the bank in the Dutch Republic. After the bank had approved the paperwork, the mortgage sum would be made available to the plantation that could start drawing bills of exchange on the bank. Communication was slow, with a one-way sailing trip taking around three months. This means that the separate phases of the securitization process were months apart; on average, at least six months had to pass before a bank would approve the mortgages it had instructed its agent to originate. During this period, many things could happen that could frustrate the process.

The volume of newly issued plantation MBS, and corresponding plantation credit, ballooned in the second half of the 1760s. In Section II, we document that this boom was likely driven by the fall in outstanding Dutch government debt.

B.2. Low reputation banks, mortgage refusals, and the end of the credit boom

At the height of the boom (between 1769 and 1770), less-reputable banks started to dominate the plantation MBS market. The reputation measure we use is based on the value of a merchant bank's premises, which is highly correlated with bank size and bankers' standing in Amsterdam. De Jong, Kooijmans and Koudijs (2025) show that with less reputation at stake, these banks aggressively extended credit, including to lower quality planters.

According to a memorandum written for the Amsterdam mayors in 1778, one low-reputation bank went so far as to extend mortgages without securing sufficient investors to purchase the plantation

MBS. When investor demand turned out to be insufficient, the bank had to refuse to fund the mortgages its agents had already originated. Hearing this news, Dutch investors started withdrawing their interest in other plantation MBS as well in 1770, leading to more mortgage refusals.[10]

After the wave of mortgage refusals, the origination of new plantation mortgages started to stagnate, especially by low-reputation banks. Overall economic conditions started to turn for the worse. The aforementioned memorandum highlights a 1769 drought that led to substantially lower crop yields, renewed attacks by maroons (formerly enslaved refugees living in the jungle) in 1771, and a decline in coffee prices. Many plantations had borrowed large sums at the height of the boom and were unable to service their mortgages. After 1773, few new mortgages were originated.

As the boom turned to bust and many plantations got into financial trouble, the merchant banks started to retrench from the business. Many tightened the provision of credit to plantations that would have otherwise been used for plantation maintenance and the import of essentials. Most importantly, plantations required regular import of enslaved labor, since death rates exceeded birth rates in the harsh working and living conditions on Caribbean plantations. As a consequence of credit tightening, merchant banks increasingly refused to pay bills of exchange that plantations had drawn.

B.3. Credit availability and slave imports

The correspondence of the Dutch slave trader MCC suggests that there was a strong link between the availability credit and slave shipments. The MCC agent in Suriname writes in April 1770 that, "the prices for slaves are flourishing," ensuring his principals that the demand for enslaved would not weaken in the next two years, "especially if the liberal availability of credit in colony remains stable." The same agent writes in February 1771 that credit conditions have deteriorated and that the demand for enslaved is weak. A month later, he writes that prices will likely recover next spring when "the current scarcity in credit should improve."[11] However in October 1773, a MCC slave captain can only sell a few of the enslaved on his ship in Suriname. The MCC agents writes that because of the decline in credit (and lower coffee prices), the demand for the enslaved has fallen, and that the price plantations are able to pay only covers the purchase cost in Africa.[12] The MCC

[10] City Archives Amsterdam, 5028: 542P.
[11] Letters received from Suriname, April 21, 1770 and March 2, 1771, cited in Unger (1961, pp. 74-75).
[12] Gootenaar to the directors of the MCC , October 18, 1773 (276-281). Zeeland Archives, Archive of the Middelburgsche Commercie Compagnie (MCC), 1720-1889, Letters of correspondents, 1720-1788, Suriname.

agent writes in 1774 that "if the colony remains starved from the necessary credit, no more enslaved can be sold here." His principals concur that, "despite the great demand for slaves, none can be sold because of the lack of credit among the planters to pay for them."[13] In the remainder of the paper, we examine the quantitative importance of the link between credit and slave imports.

II. Macro-economic trends

Figure 1 shows macroeconomic developments in the Dutch Republic between 1750 and 1780. Panel A displays the change in Dutch government debt levels (in guilders) together with yields on Dutch and English redeemable annuities. After 1753, the Dutch Republic started to repay its sizeable debt and, as a result, Dutch yield fell below the English ones. The Dutch Republic would stay out of any wars up to 1780 and kept repaying its debts, especially after 1765. In response, Dutch banks stepped in to facilitate the issuance of alternative assets. At the time, Amsterdam was the financial center of the world (Kindleberger 1978, De Vries and van der Woude 1997) and the guilder acted as an international reserve currency, which led to a high demand for guilder denominated assets (Coppola, Krishnamurthy and Xu 2023).[14] Further, there was a large group of *Rentiers* in the Dutch Republic that lived of passive income and who sought alternative investments for savings they could no longer put in Dutch government debt (e.g. Korevaar 2023).

Panel B shows the origination of mortgages in Suriname securitized by Dutch merchant banks and sold to investors as plantation MBS. The panel suggests that the mortgage boom in Suriname was largely driven by Dutch investors searching for alternatives to Dutch government debt. The first large plantation MBS issuance (by Deutz & Co.) took place in 1753, right around the time the Dutch government started repaying debt, instead of being a net borrower. The second (and much larger) wave of plantation MBS originations started after 1765, when the yield on Dutch government debt fell from approximately 2.8 to 2.5%.

Panel B also shows the decomposition of merchant-bank types involved in the securitization of plantation mortgages (positive numbers mean new mortgage originations; negative numbers mean

[13] Gootenaar and Brouwer to the directors of the MCC, 7 June 1774 (288-291). Zeeland Archives, Archive of the Middelburgsche Commercie Compagnie (MCC), 1720-1889, Letters of correspondents, 1720-1788, Suriname; 11 March 1774, Copieboek (Inv. nr. 100), cited in Unger (1961, p. 13).

[14] In similar vein, British banks extended a larger amount of bills of exchange after the British government started to down their debts from the Napoleonic Wars in the early 19th century when the Pound Sterling had become the international reserve currency, while American banks created modern mortgage-backed securities (MBS) in response to the high demand for dollar assets in the 2000s.

mortgage refinancings). Initially, the market was dominated by high-reputation banks (defined in de Jong, Koudijs and Kooijmans (2025)), with low-reputation banks dominating at the height of the boom in 1769 to 1770.

Figure 2 shows macro-economic developments in Suriname around the same time. Both the number of plantations and enslaved grew substantially between 1760 and 1769, by about 20% and 37.5%, respectively. Numbers grew more moderately between 1769 and 1772 and the number of enslaved started to fall thereafter.

Figure 3 shows that the expansion of mortgage credit and the increase in the number of enslaved appear tightly linked. Panel A shows that between 1760 and 1771 the percentage of plantations with a mortgage grew from 27% to 66%. Panel B shows that the annual number of newly issued mortgages grew from about 10 in the early 1760s to about 65 in the boom years 1769 to 1770, with the average mortgage size also growing from 32,951 to 112,472 guilders.

III. Colony-level evidence

To what degree can we attribute the increase in number of enslaved people in Suriname in the 1760s to the expansion of (mortgage) credit? We first address this question by comparing Suriname with similar Caribbean colonies.

A. Suriname vs Demerara-Essequibo

Figure 4 shows extension of new mortgage credit, number of imported enslaved and appraised values of enslaved in Suriname and their market values upon arriving from Africa, all as a three-year moving average to smooth out idiosyncratic annual variation. Panel A shows new mortgage credit and import volume of enslaved to Suriname. Starting in 1765, mortgage credit grew strongly, peaking in 1770. Contemporaneously, the imports of enslaved increased as well, peaking one year later in 1771. This one-year lag is natural given the information delays; there were no direct ships from Suriname to the African coast and information would arrive through the Dutch Republic at least six months later.

It is possible that a third factor drives the contemporaneous relationship between credit and importation of enslaved people, or alternatively that an expansion in the supply of enslaved labor induced planters to take up more credit. Panel B, which focuses on Demerara-Essequibo, suggests that these explanations are unlikely. As discussed above, institutional restrictions limited

Amsterdam bankers' ability to operate in the colony prior to 1771, constraining the supply of mortgage credit. Panel B shows that credit expanded sharply after these restrictions were lifted, peaking in 1774, with most of the additional lending originating from Amsterdam. Imports of enslaved people increased contemporaneously, but with a one-year lag relative to credit growth.

The fact that both colonies saw a similar relation between credit and imports of enslaved, but approximately four years apart, indicates that factors that were common to both colonies, such as commodity prices or changes in the slave trade, are unlikely to explain our findings. It also suggests that the link between credit and imports of enslaved is systematic.

Panel C shows appraised values of enslaved in Suriname and their market values upon arriving from Africa. It provides further evidence that our findings are not driven by a shift in the supply of enslaved labor: the increase in imports up to 1771 went hand in hand with an increase in prices and valuations, suggesting patterns are driven by demand factors instead.

B. Suriname and Demerara-Essequibo vs British and French colonies

Next, we compare the imports of enslaved to Suriname and Demerara-Essequibo with similar British and French Caribbean plantation colonies: Barbados, Jamaica, the British Leeward Islands, the French Windward Islands (Guadeloupe and Martinique), and Saint-Domingue. We omit Grenada, Dominica and St. Vincent that were initially French, but were taken over by the British after the Seven Years' War (1756-1763), turning them into the British Windward Islands. At that point, they were newly developed (Murdoch 1984; Quintanilla 2003), making them a poor comparison group for the Dutch colonies. We do not consider slave shipments to Spanish colonies, which were officially restricted before 1789 and therefore infrequent,[15] or to the Danish American Island (today's U.S. Virgin Islands), which were small and only saw an average of two slave shipments per year between 1760 and 1780. Internet Appendix B provides summary statistics of the plantation economies we consider.

Figure 5, Panel A provides (index) numbers for imports of enslaved to the Dutch, British and French plantation colonies, again as three-year moving averages with 1766 as base year. Data for the French only starts in 1763 because they were unable to ship enslaved during the Seven Years' war. Between 1760 (1764) and 1766, the colonies of all three nations saw increases in the imports of enslaved. If

[15] Between 1760 and 1780, the average number of slave shipments Cuba, Puerto Rico and Santo Domingo was less than one. www.slavevoyages.org.

anything, Dutch imports increased the least. After 1766, French and British imports stagnated, while Dutch imports kept increasing until 1771, falling thereafter. This suggests that the growth of Dutch mortgage credit between 1765 and 1770 led to differentially stronger growth in slave imports as compared to the British and French colonies.

We explore this further by estimating the following specification:

$$\ln(imports_{c,t}) = \sum_{t \neq 1766} \beta_t D_{c,t} + \theta_c + \lambda_t + \varepsilon_{c,t}, \quad (1)$$

where $imports_{c,t}$ is the number of enslaved imported by colony c in year t as a three-year moving average, $D_{c,t}$ is a dummy for Dutch colonies in a given year t and θ_c and λ_t are colony and year fixed effects. The omitted category is 1766. We plot the β_t coefficients and 95% confidence intervals based on Newey-West standard errors.

Panel B weighs colony-year observations by colony size (measured by the log number of enslaved imported during 1700-1750). Pre-trends are parallel. Between 1766 and 1771, there was a differential increase in slave imports to the Dutch colonies of more than 50 log-points. For Panel C, we compute entropy weights that balance colonies on the mean share of sugar in total production and the mean log number of years between first colonization and 1764 (Hainmueller 2012). These weights account for sugar and coffee plantations possibly being on different trajectories and younger colonies possibly having higher growth rates. In this specification, effects are larger and more persistent, capturing the fact that the Dutch colonies had relatively many coffee plantations that grew quickly in the late 1760s but experienced trouble in the 1770s.

In sum, compared to similar plantation colonies, the extension of large mortgage sums to Dutch plantations appears to have led to a stronger growth in slave imports.

IV. Plantation-level evidence

The evidence from comparing different colonies suggests that the extension of credit in Suriname led to a strong increase in the import of enslaved labor from Africa. Next, we consider variation in the origination of mortgages to individual plantations in Suriname.

A. Staggered mortgage originations

We first provide correlational evidence, showing that the timing of mortgage origination is strongly related to an increase in enslaved labor on individual plantations. Data is for 1760-1771. We follow

Wooldridge (2021) and first estimate the following saturated staggered difference-in-difference specification that allows for heterogeneous treatment effects $\beta_{y,t}^{post}$:

$$\ln(enslaved_{i,t}) = \sum_{y \in Y} \sum_{t=t_0}^{y-2} \beta_{y,t}^{pre} D_{i,y,t} + \sum_{y \in Y} \sum_{t=y}^{T} \beta_{y,t}^{post} D_{i,y,t} + p_i + \lambda_t + \varepsilon_{i,t}, \quad (2)$$

where $enslaved_{i,t}$ is the number of enslaved on plantation i in year t, $y \in Y$ indicates a cohort of plantations that obtain a mortgage in year y, and $D_{i,y,t}$ is a dummy with value 1 if plantation i is part of cohort y and the period is t. Finally, p_i and λ_t are plantation and year fixed effects. Parameters $\beta_{y,t}^{pre}$ capture the pre-trend while $\beta_{y,t}^{post}$ capture the treatment effects. In this specification, the omitted group consists of plantations that never got a mortgage (never treated). We can also estimate this without the first double-summation. In that case, the omitted group contains plantations that did not get a mortgage yet (not-yet treated) and pre-trends cannot be estimated.

We then calculate the Average Treatment Effect on the Treated (ATT) by first predicting the outcome variable given the estimates of Eq. (2). We then predict the outcome variable setting $\beta_{y,t}^{pre}$ and $\beta_{y,t}^{post}$ to zero. The difference between the two gives the ATT for each t separately or for the full period after treatment. Standard errors are clustered at the plantation level.

The estimates in Figure 6, Panel A show that in the years before obtaining a mortgage, plantations did not see an increase in the number of enslaved compared to plantations that never obtained a mortgage. However, in the year of treatment, the number of enslaved starts increasing, with an average relative increase of 15% after 5 years. Most mortgage contracts stipulated that the plantation could increase its borrowing if its value had increased. Panel B splits this up in plantations getting a mortgage at the maximum loan-to-value ratio (LTV) of 5/8 or lower. The effects are substantially stronger for plantations getting a larger mortgage.

Table 1 provides regression estimates of the ATT for the full treatment period. Panel A has estimates on slave purchases from two large slave traders (the MCC and Coopstad and Rochussen), jointly covering around 30% of all slave imports into Suriname. After a plantation obtained a mortgage, its purchases of enslaved increased by 5%. This effect is predominantly coming from plantations with high LTV mortgages. Panel B has estimates on the number of enslaved on a plantation.

Estimates are similar but economically larger. This is likely due to the fact that Panel A misses purchases from slave traders other than the MCC and Coopstad and Rochussen.

Internet Appendix C shows estimates of Eq. (2) omitting the first double summation. It also shows alternative staggered difference-in-difference estimators suggested by Callaway and Sant'Anna (2021) and Sun and Abraham (2021). Results are virtually the same.

B. Mortgage refusals

The fact that plantations obtained more enslaved labor after getting a mortgage is consistent with external finance stimulating the slave trade. Our next goal is to use plausibly exogenous plantation-level variation to get as close to causal estimates as possible. We start with mortgage refusals.

Typically, all mortgages that were provided by a bank's agent(s) in Suriname were accepted for payment. As explained in Section I.B.2, one low-reputation bank had failed to secure enough buyers for its plantation MBS towards the end of the boom in early 1770. It ended up refusing some of the mortgages its agent had provided in Suriname. Disturbed by these events, investors became generally less willing to buy new plantation MBS from low-reputation banks and more mortgages were refused. We use variation in mortgage acceptance and refusals across low-reputation banks to identify the effect of mortgage acceptance on the number of enslaved on a plantation.

Figure 7 shows a timeline of all mortgage originations between 1765 and 1774. Black bars indicate mortgages that were eventually refused, all provided by low-reputation banks. Grey bars indicate the mortgages that were accepted by the same subset of low-reputation banks. Light red and red indicate all mortgages that were accepted by high and low-reputation banks that did not refuse any mortgages. The reported month is for the date of the mortgage registration in Suriname. The figure shows a sudden spike in refusals for mortgages provided after April 1770. Because of the average one-way travel time of three months, the actual refusals in Amsterdam would happen later, starting in July 1770.[16] News about the Amsterdam refusals reached Suriname even later, on October 22, 1770.[17]

[16] See De Jong, Koudijs and Kooijmans (2005, IA Section III, Figure IA.V).

[17] On 22 October, 1770, Suriname governor Nepveu noted "very great perplexity due to the protests of bills of exchange, which the agents of merchants in Holland extended based on plantation mortgages. Extreme confusion and distress will arise in the colony, because the amounts will total around 1.5 million. I had strong reservations about all the exorbitant credits, but I had not expected this blow to fall so suddenly." (authors' translation) In his previous letter dated October 11, 1770, Nepveu made no mention of a large number of protests of bills of exchange yet. Dutch National Archives, Archive of the Sociëteit van Suriname, 1650-1796 (1.05.03), 342.

We investigate to what extent the number of enslaved increased on plantations that had their mortgage accepted relative to those that had it refused. For comparability, we focus on mortgages provided by low-reputation banks only. Whether a given bank refused one mortgage but accepted another is likely endogenous. We therefore implement an intent-to-treat design, where we compare all plantations seeking a mortgage during the 12 months before or after April 1770 from a low-reputation bank that eventually accepted all mortgages ("accepting bank") or that refused at least some mortgages in the second quarter of 1770 ("refusing bank"). Estimates can be interpreted causally if the choice among low-reputation banks is conditionally uncorrelated with other determinants of plantation growth (after 1769).

Table 2 provides summary statistics. Panel A shows that for both refusing and accepting banks, about 85% of mortgage lending occurs withinthe 24-month event period. However, the share of mortgages provided in the months after April 1770 was far larger for refusing banks (61% vs 10%). Most of these mortgages were provided right before the end of the boom when agents in Suriname were still unaware of the wave of refusals that was on its way from Amsterdam. This suggests that (unfortunate) timing is the key factor determining whether a low-reputation bank had to refuse (some of) its mortgages.

The rest of Panel A shows that the two groups of low-reputation banks are similar in other dimensions. If anything, refusing banks had a relatively good reputation (higher value of their premises), but the economic size of this difference is small.[18] In terms of total plantation MBS volume and experience, the two groups look very similar.

Panel B shows that plantations that sought mortgages from refusing and accepting banks are largely similar as well. All characteristics are as of 1769. By then, roughly 80% of plantations applying for a mortgage in 1770 already had one. The plantations that sought a new mortgage from a bank that would eventually refuse applications had contracted their older mortgages at a lower LTV. These plantations were also older. If anything, both characteristics suggest higher quality. Further, these plantations had fewer enslaved and more acres of land and therefore a lower enslaved-to-acres ratio (0.15 vs 0.18), which, if anything, suggests more growth opportunities. However, the difference in ratios is not statistically significant. Crop type and upland location do not differ. Panel C shows that

[18] The difference is 100 guilders. This is small compared to the difference between low and high-reputation banks of about 650 guilders (see De Jong, Koudijs and Kooijmans 2025, Figure 1)

planters in the two groups were virtually identical in terms of whether they lived in the colony, were members of the colonial administration and their experience as planter.

Figure 8 provides estimates of a standard dynamic two-by-two fixed effects specification, comparing the number of enslaved on plantations that sought a mortgage during the 24 months around April 1770 from a low-reputation bank that eventually refused some or all incoming mortgages, with plantations that sought a mortgage from a low-reputation bank that eventually accepted all mortgages. Panel A has no additional covariates; Panel B controls for interactions between year dummies and the bank's office value, a dummy for high LTV mortgages and the log(age) of the plantation, all as of 1769. The figure shows no differential pre-trends in the number of enslaved up to 1769. However, in 1770 and 1771, the number of enslaved on plantations that sought a mortgage from a bank that eventually accepted all mortgages is about 10-15% higher. If anything, estimates become larger after including interactions with covariates, suggesting that pre-existing differences between plantations are not driving the results.[19] Most mortgages provided by low-reputation banks in 1770 and 1771 were at the maximum LTV of 5/8 and we can directly compare these estimates to the ones for high LTV mortgages in Figure 6. The two sets of estimates are largely consistent.

Table 3 implements 2SLS IV estimates, using bank type (accepting vs refusing) as an instrument for whether a plantation actually got its mortgage accepted. Column (1) has the OLS estimate and column (2) the reduced form (corresponding to Figure 9). Column (3) shows the first stage: if the plantation sought a mortgage from an accepting bank, it was 62 percentage points more likely to be accepted. The F-statistic is 68.5. Column (4) has the IV estimate, which indicates that mortgage acceptance led to a differential increase in the number of enslaved of about 20%. The estimate from the IV is comparable to that from the OLS, although somewhat larger, suggesting the LATE is larger than the ATE.

C. Staggered tightening of credit

As we explain in Section I.B.2, merchant banks started to tighten plantation credit after the end of the credit boom in 1770 by refusing bills of exchange that planters had drawn on them. Figure 9 shows that the exact moment banks started to do this differed substantially. Panel A provides

[19] Results are robust to adding interactions with the log number of enslaved and the log number of acres, both as of 1769.

examples of six banks. Each of these banks had a clear peak in refusals, each in a different year.[20] Panel B shows the distribution of peak years across all banks. The median bank refused a high volume of bills in 1773, but there is substantial variation. We take these peaks as the moment that a bank started tightening credit to the plantations it did business with. We use this differential timing to estimate the effect of credit access on the number of enslaved on a plantation.

Table 4 has hazard-model estimates predicting the year of a bank's peak in refused bills of exchange, using the characteristics of the plantations it did business with. We present hazard ratios, where an estimate above 1 indicates that a plantation characteristic predicts an earlier peak. Of the nine characteristics, only two are economically important and statistically significant. If the planter lived locally (instead of in Europe) or had less experience, this predicts an earlier peak. Otherwise, the number of enslaved, mortgage LTV, plantation age, size and location and planter membership in the local administration (a measure for being part of the colonial elite) do not appear to be associated with the timing of the peak in refusals of bills of exchange. This suggests that the timing of the peak is largely driven by bank, not plantation characteristics, and that it is unlikely that factors other than credit tightening can explain the effect on the number of enslaved on a plantation.

Figure 10 provides staggered two-way fixed effect diff-in-diff estimates. We follow Wooldridge (2021) and estimate Eq. (2) with or without controlling for a planter's experience and place of living times the year dummies. We either use plantations without a mortgage as control (never treated) or plantations with a mortgage from a bank that had not restricted credit yet (not-yet treated). We can only calculate pre-trends using the first control group.

The figure shows no evidence for differential pre-trends. The treatment effect is economically important: five years after a bank started to tighten credit, the average number of enslaved declines by 13%. Effects are somewhat smaller when using not-yet treated plantations as control. Results become stronger when controlling for a planter's experience and place of living times the year dummies, suggesting that differences in plantation characteristics are not driving the effect. Internet Appendix D shows alternative staggered difference-in-difference estimates suggested by Callaway and Sant'Anna (2021) and Sun and Abraham (2021) with and without controls. Results are

[20] The declining volume of refusals after these peaks does not mean that banks started to honor bills of exchange again. Instead, plantations stopped drawing bills altogether as to avoid the hefty penalty of 25% of face value associated with having a bill refused.

consistent and also become stronger after including controls. In sum, the tightening of credit had substantial effects on the number of enslaved on the plantations.

V. Aggregate estimates incorporating price effects

Next, we estimate the mortgage boom's contribution to aggregate slave shipments to Suriname between 1765 and 1771 by aggregating our diff-in-diff estimates over all individual plantations in our sample. For this exercise, we explicitly take aggregate price effects into account. The expansion of credit increased the aggregate demand for enslaved and, as long as the supply was not infinitely elastic, likely increased prices of enslaved, which would have suppressed imports.

A. Conceptual framework

A.1. Existing plantations

We apply different approaches to existing and newly established plantations. Figure 11 illustrates our approach for existing ones. Panel A shows the general equilibrium where we assume that the additional credit availability pushes out the demand curve for enslaved is from D to D'. Holding the supply curve unchanged at S, the equilibrium price increases from p to p'. Panel B is in partial equilibrium and shows the demand schedules of individual plantations that obtain a mortgage or not. We assume that the demand curve of plantations $m \in M$ that obtained a mortgage shifts outwards from d to d'. At the same time, the equilibrium price increases to p'. Plantations m's imports will therefore increase from q to q'_m. We assume that the demand schedule of plantations $n \in N$ without a mortgage remains the same at d. In response to an increase in the equilibrium price, their slave imports will decrease from q to q'_n.

The aggregate effect on slave imports by existing plantations therefore consists of two parts: an increase in imports by plantations with a mortgage driven by higher demand, and a general decline in imports due to price effects. Regardless of the exact price effect, $q'_m - q'_n$ corresponds to the additional slave imports from an outward shift in the demand curve. Empirically, this can be inferred from our diff-in-diff estimates of the additional growth in the number of enslaved on plantations with a mortgage compared to those without. To get an estimate of the price effect on imports, $q'_n - q$, we need (i) estimates of the elasticity of slave demand to changes in price, ε, and (ii) the aggregate price effect of the credit-induced increase in aggregate demand, Δp.

A.2. New plantations

For new plantations, we need to estimate the probability that entry was induced by the credit boom.. We focus on all plantations that entered with a mortgage, NM_t during for $t \in \{1765,1771\}$. We estimate the probability that they entered because of the credit boom as:

$$\pi_t = \frac{NM_t - E_t[NM_t|NN_t, \mathcal{P}]}{NM_t}, \tag{3}$$

where NN_t is total number of plantations without a mortgage entering in t and $E_t[NM_t|NN_t, \mathcal{P}]$ is the expected number of plantations entering with a mortgage, which we calculate as:

$$E_t[NM_t|NN_t, \mathcal{P}] = NN_t * \frac{\sum_{t \in \mathcal{P}} NM_t}{\sum_{t \in \mathcal{P}} NN_t}, \tag{4}$$

where $\mathcal{P}$ is the pre-boom period with $t \in \{1760,1764\}$. The underlying assumption is that the average ratio of new mortgage to non-mortgage plantations would have remained constant after 1764 had the credit boom not happened.

B. Estimating the elasticity of demand for the imports of enslaved.

To calculate the elasticity of demand ε, we use an exogenous shifter in the supply of enslaved people. In terms of Figure 11, Panel A, we need to shift the supply curve to estimate the slope of the demand curve. An important input cost for transatlantic shipping, including the slave trade, was insurance (Lurvink 2019). Premia could vary significantly due to changes in international tensions, piracy, and general financial conditions in Amsterdam (Spooner 1983, pp. 113-115, 196-197). Higher premia would make it more expensive to ship enslaved, leading to an inward shift of the supply curve. We use insurance premia quoted in the Amsterdam underwriting market for ships setting sail to Suriname as an instrument for prices of enslaved. Since the prevailing winds steered ships headed for Suriname past West-Africa, this closely approximates the premia that slave traders would have paid.

Table 5 provides IV estimates using pre-boom (1752–1764) insurance premia and price data to estimate the demand elasticity of slave imports. We aggregate available data for insurance premia, prices and imports at the quarterly level. In the first stage, we instrument the natural log of the price of the enslaved p_t with the log of insurance premia σ_{t-4} four quarters before arrival and sale (the average time between a slave trader's departure in Amsterdam and arrival in Suriname; see Internet Appendix F):

$$p_t = \alpha_0 + \alpha_1 \sigma_{t-4} + \alpha_2 W_t + \phi_q + u_t. \quad (5)$$

From 1758q1 to 1760q2 (the height of the Seven Years war) there was significant British naval action in the Caribbean against the French. This decreased French slave imports and led to a lower price level. To control for this, we include a dummy W_t for this period. To control for seasonal effects, we include dummies for each quarter of the year ϕ_q. Because of the prevailing winds, certain quarters were more suitable for sailing than others and this was reflected by insurance premia as well (Spooner 1983, p. 198). We do not want to base our elasticity estimates on this variation, as it would have been relatively easy to shift imports from one quarter to another.

In the second stage, we estimate the effect of instrumented prices $\hat{p}_t$ on slave imports q_t with 2SLS:

$$q_t = \beta_0 + \beta_1 \hat{p}_t + \beta_2 W_t + \phi_q + u_t. \quad (6)$$

where β_1 corresponds to the demand elasticity ε. Imports is the number of enslaved people imported to Suriname, smoothed because raw imports are extremely volatile due to developments in Africa and weather conditions at sea. We use the Kalman filter, where observed imports are decomposed into a persistent trend and transitory noise. To avoid the war episode mechanically influencing the surrounding trend, we apply the filter separately within the pre-war, war, and post-war segments.[21]

Column 1 has the OLS regression. There is a negative relation between prices and quantities. Column (2) has the reduced form and shows that lagged insurance premia are negatively related to slave imports. Column (3) has the first stage and shows that insurance premia predict prices of enslaved with an F-statistic of 11.41. Column 4 has the 2SLS estimates, showing a statistically significant demand elasticity ε: a 1% increase in the price of enslaved leads to a 0.546% decrease in demand for imports.

Figure 12, Panel A shows actual slave prices against those predicted by lagged insurance premia between 1752 and 1771. Overall, there is a good fit between the two series. However, during the credit boom, especially 1769 and 1770, the price increases much more than expected based on

[21] Where two periods connect, we use the average smooth estimate of both estimates for the first observation. We prefer the Kalman filter over a moving average, which is not defined at the first number of each segment and ignores the data-generating structure. Estimating a state-space model and using the Kalman filter produces estimates that are well defined throughout each short segment. The resulting estimates are implicitly weighted by the model's estimated signal-to-noise ratio and the evolving state uncertainty (details are in Internet Appendix F).

insurance premia. We take this as the price impact of the additional credit availability. In particular, we calculate $\Delta\hat{p}_t$ as the average difference between actual and predicted prices during 1765 to 1771.

C. Aggregate calculations

We calculate annual aggregate imports that can be attributed to the expansion of mortgage credit, ΔS_t^M, for $t \in \{1765,1771\}$ as:

$$\Delta S_t^M = \frac{1}{1-\rho}\left\{\sum_{i\in M_t}\gamma s_{i,t} - \sum_{i\in P_t}\varepsilon\Delta\hat{p}_t \max\{0,(s_{i,t} - s_{i,t-1}(1-\delta))\} + \sum_{i\in NM_t}\pi_t s_{i,t}\right\}, \qquad (7)$$

where P_t are all plantations existing at the beginning of year t, with M_t plantations that have a mortgage, and NM_t are all new plantations that enter with a mortgage in t. The number of enslaved on plantation i in year t is denoted as $s_{i,t}$. The yearly additional growth of the number of enslaved on existing plantations that can be attributed to the mortgage boom is denoted by γ, with $\gamma s_{i,t}$ corresponding to $q'_m - q'_n$ in the conceptual framework. General price effects are given by the product of the demand elasticity, ε, with the price change in t that can be attributed to the mortgage boom, $\Delta\hat{p}_t$, with $\varepsilon\Delta\hat{p}_t \max\{0, s_{i,t} - s_{i,t-1}(1-\delta))\}$ corresponding to $q'_n - q$. We consider the positive change in the number of enslaved on a plantation, corrected for attrition δ – on net, slave mortality exceeded fertility (Stipriaan 1993, p. 213, 269) – and calculate how much larger this increase would have been absent the price effect of the boom. The probability that a new plantation with a mortgage entered because of the credit boom in t, π_t, is given by Eqn. (3). Because data coverage for individual plantations is incomplete, we need to inflate the number of plantations with one minus the fraction not in our data, ρ, to make a comparison with the aggregate slave imports.

We use the following parameters. We set γ at 0.03 based on the correlational diff-in-diff evidence in Figure 6, which shows the average annual growth of the number of enslaved on plantations after obtaining a mortgage compared to plantations without a mortgage. The figure documents continued differential growth for at least five years after a plantation got a mortgage. This is likely driven by (i) plantations not spending the entire mortgage sum in the first year, and (ii) plantations keeping access to new credit in later years by drawing bills of exchange on their banks and by enlarging the mortgage to 5/8 of the plantations' newly appraised value if this had gone up. We set the attrition rate δ at 0.027. This is based on detailed annual data of individual enslaved for 17 plantations over the period 1757-1796 (with a total of 120 plantation-year observations). Internet Appendix F

(Figure F.3) pins down ρ by comparing annual aggregate imports with the change in the number of enslaved over all plantations in our sample applying the same attrition rate of 0.027. To make the two series consistent, we need to set ρ at 0.25.

Using these parameters, Eqn. (7) yields:

$$\sum_{t=1765}^{1771} \Delta S_t^M = \frac{1}{1-0.25}\{3{,}643 - 1{,}793 + \ 1{,}595\} = 4{,}593. \tag{8}$$

This represents an increase of 16.89% of all enslaved shipped to Suriname over this period. Figure 12, Panel B shows counterfactual slave imports by removing the ΔS_t^M from the (smoothed) aggregated slave imports. Counterfactual imports are consistently below actual imports, but the gap narrows in 1769-1770 when we estimate a large increase in the price of enslaved due to the credit boom.

D. Alternative aggregate calculations

We compare our micro-level counterfactual predictions with those implied by our macro-estimates. In particular, we use the pre-boom (1752–1764) reduced-form regression of Table 5 to predict slave imports with insurance premia alone, assuming a fixed demand curve at pre-boom levels. We predict this counterfactual $\hat{Q}_t$ as

$$\ln(\hat{Q}_t) = \alpha_0 + \alpha_1 \sigma_{t-4} + \alpha_2 W_t + \phi_q \tag{9}$$

where σ_{t-l} is the insurance premium for travel between Amsterdam and Suriname, four quarters lagged, W_t indicates war periods and ϕ_q are quarter of the year dummies.

Figure 12, Panel B shows that the macro estimates imply an even bigger gap between actual and predicted imports of an additional 5,032 enslaved, which would imply that the credit boom increased the import of enslaved people by 43.45%. The key driver of difference between the micro and macro estimates is the increase of imports by non-mortgage plantations during the boom period. It is plausible that this was driven by favorable economic conditions, but it also possible that speculative demand for enslaved due to price increases during the boom was responsible.

VI. Crowding out?

It is possible that the additional Dutch exports of enslaved to Suriname and Demerara-Essequibo crowded out shipments by other European countries and had limited net effects on the total forced displacement of people from Africa. We test for this using information about the locations from

where the enslaved departed Africa. Internet Appendix A has a map of the African regions and ports used by slave traders of different European countries (England, Portugal, France, the Dutch Republic and Denmark). We test whether locations (port, region, continent) where Dutch traders were active had fewer slave shipments by other countries during the credit boom in the Dutch colonies (1767-1772). In particular, we estimate the following equation:

$$Shipment_{c,\ell,t} = \beta Boom_{\ell,t} + \gamma_{c,\ell} + \delta_t + \varepsilon_{c,\ell,t}, \quad (10)$$

where $Shipment_{c,\ell,t}$ is equal to natural log of 1 + the number of shipped people by colonizer c (in '000), from African location ℓ, in year t.[22] $Boom_{\ell,t}$ is an indicator variable for boom years in locations where Dutch traders were active before the start of the boom. The sample period starts in 1764, after the Treaty of Paris ended the Seven Years' War, and ends in 1776, before the start of the Anglo-French War. The regression includes colonizer-location fixed effects $\gamma_{c,\ell}$ and year fixed effects δ_t. The region and port-level regressions include observations for a given location-colonizer if there was at least one voyage per year on average within the sample period. Observations with Dutch shipments are omitted. Standard errors are clustered by location-period.

Internet Appendix B has summary statistics of the slave voyages we consider; around 32% of all shipments came from regions where Dutch traders were active. Figure 13 has the estimates of Eq. (3) and shows β estimates at the port, region or continent level. Results indicate that there is some evidence for crowding out at the port level, although this is not statistically significant. This disappears at the region and continent level. To the degree that Dutch shipments of enslaved crowded out other countries' shipments from the same port, it seems that the latter were able to make up for this by increasing shipments from alternative locations. In sum, there is little evidence for crowding out.

VII. Conclusion

This paper shows that increases in credit to Dutch slave plantations in Suriname led to higher imports of enslaved from Africa, which were not compensated by other colonial powers importing less. We estimate that a positive shock to the availability of credit increased slave imports by 27-43%. This suggests that credit, which was widely used in colonial plantation systems, contributed

[22] Internet Appendix D shows that the log 1 + transformation does not lead to gaps or spikes in the distribution of the variable.

importantly to forced displacement of Africans to the Americas. This finding complements existing views about the causes of American slavery. Using their plantations, including the enslaved labor, as collateral, planters could tap into their home country's financial market to expand their businesses. It seems likely that absent financial innovations that supported these credit flows fewer Africans would have been enslaved and forcibly displaced.

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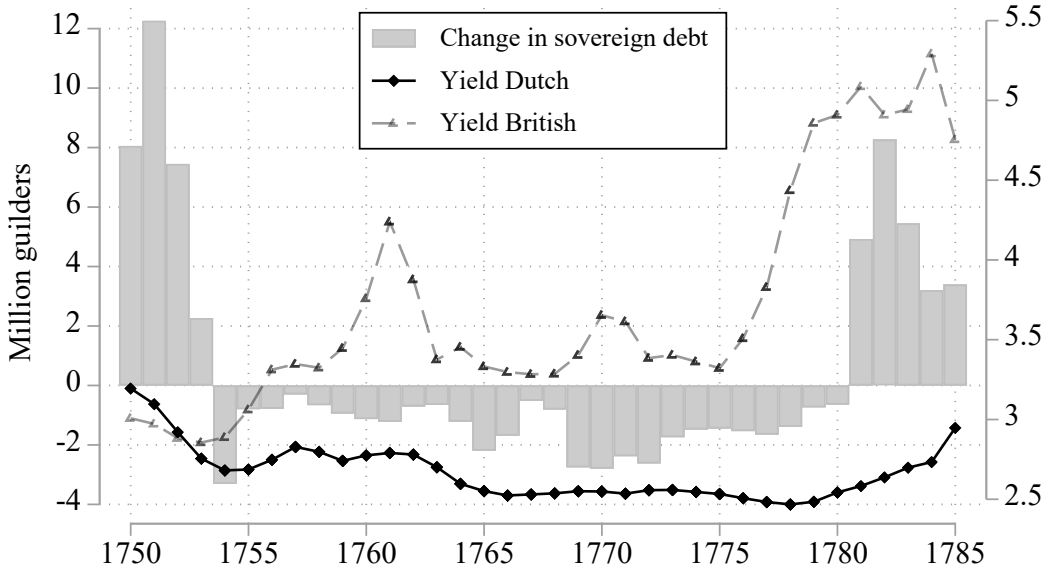
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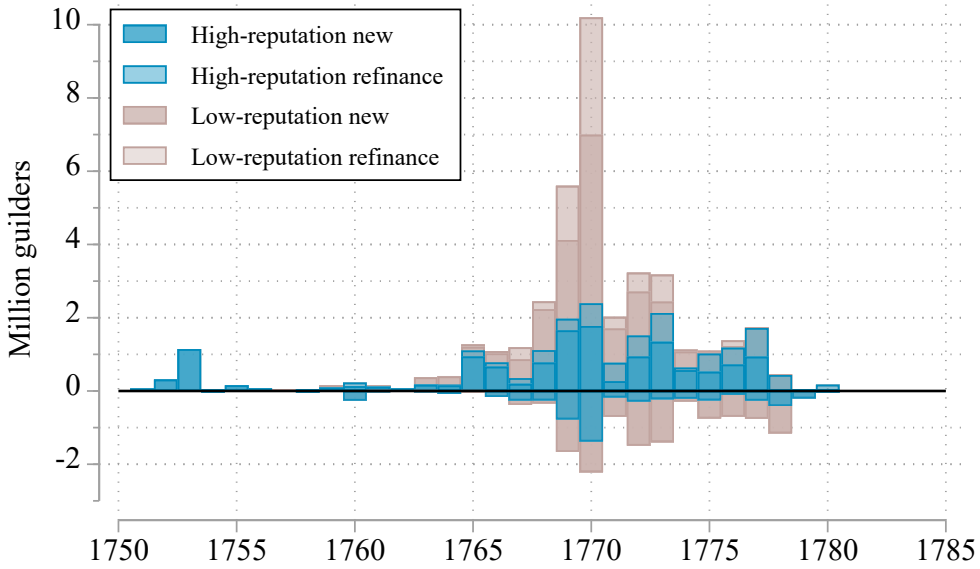
Figures and Tables

Figure 1: Dutch government debt repayment and plantation mortgages in Suriname

Panel A: Government debt levels and yield

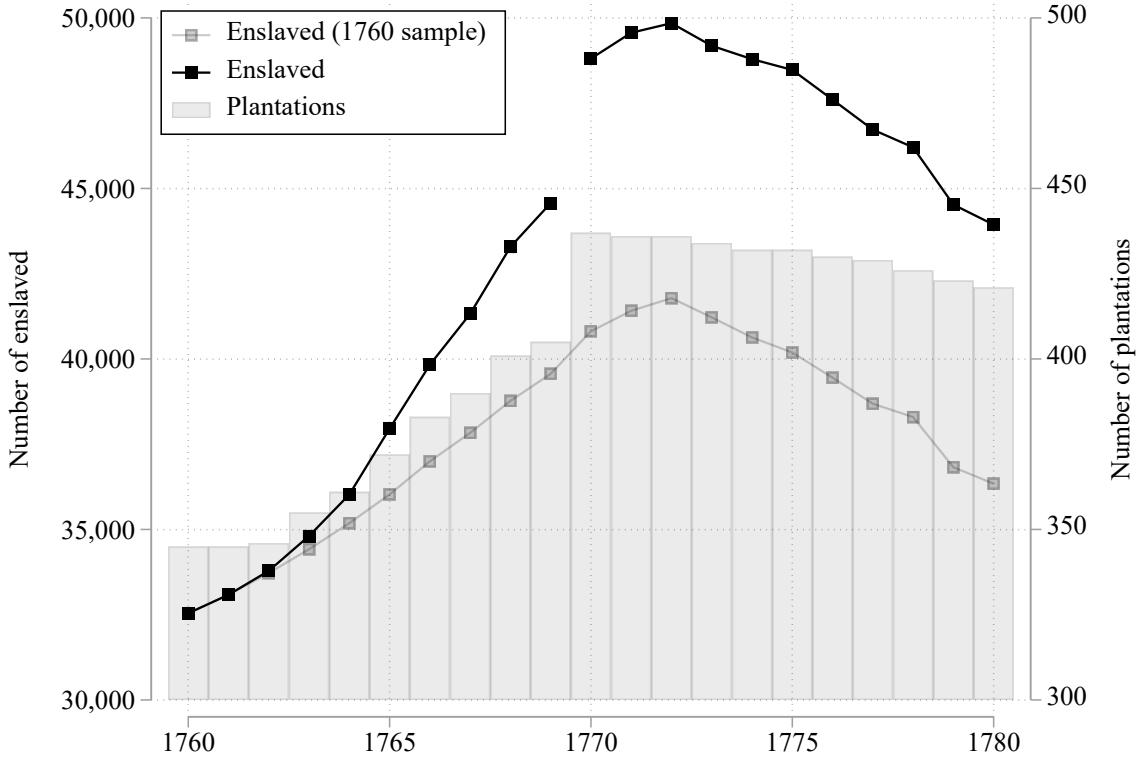


Panel B: Yearly mortgage issuance



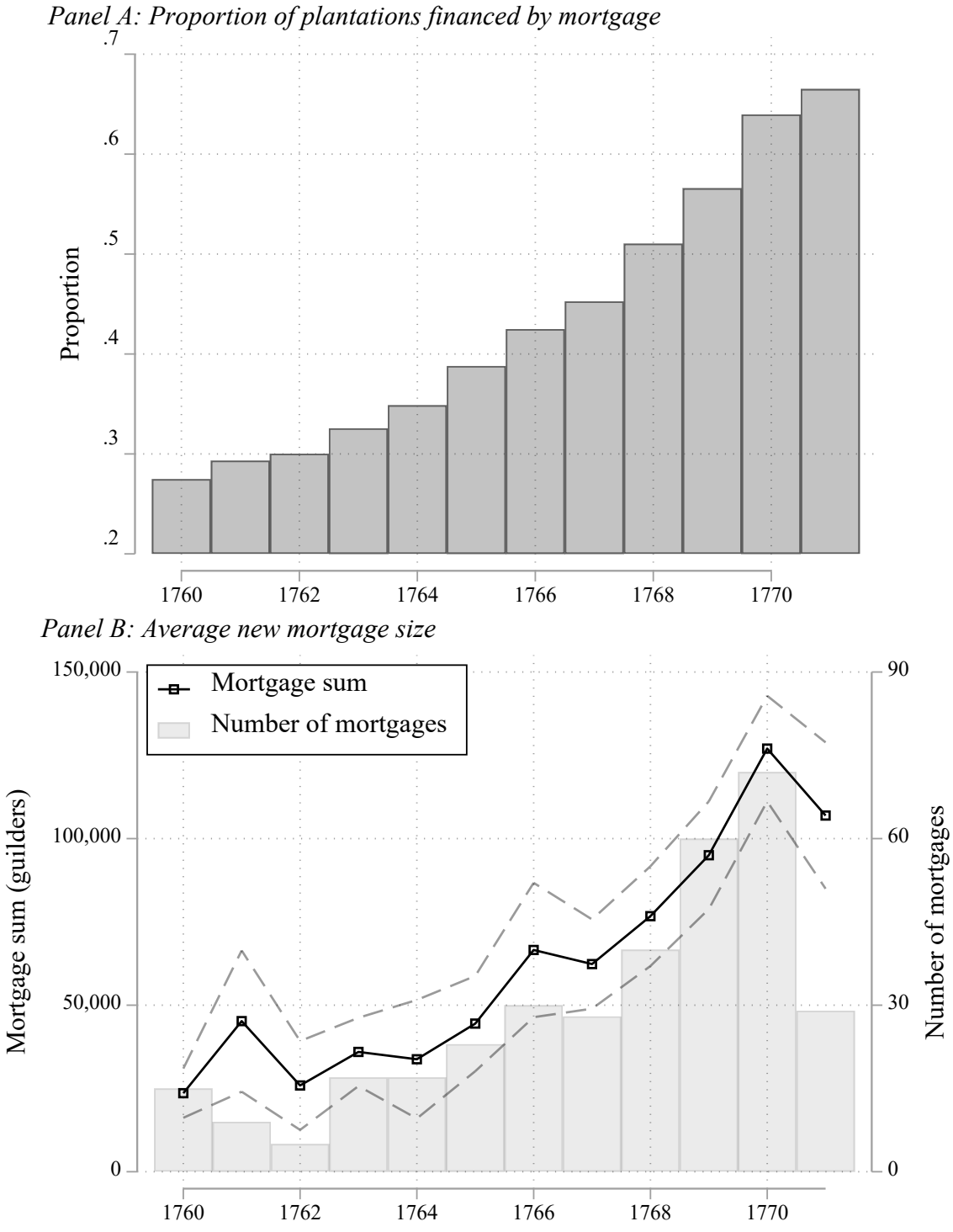
Panel A shows 2-year moving average changes in outstanding sovereign debt of Holland from Dormans (1991), p.111, and 2-year moving average current yields on Holland and British sovereign debt. Holland debt is for *losrenten* from data shared by Oscar Gelderbom and Joost Jonker, see: Gelderblom and Jonker (2011). English debt is for 3% Annuities from Thorold Rogers (1902, Vol III. Part II) and Neal (1990). Both *losrenten* and annuities were redeemable at par. Panel *B* shows yearly mortgage issuance of low- and high-reputation merchant banks. *Refinances* are mortgages previously extended by a different bank. Negative numbers indicate that a plantation refinanced a mortgage with a different bank, repaying the old bank.

Figure 2: Slavery in Suriname



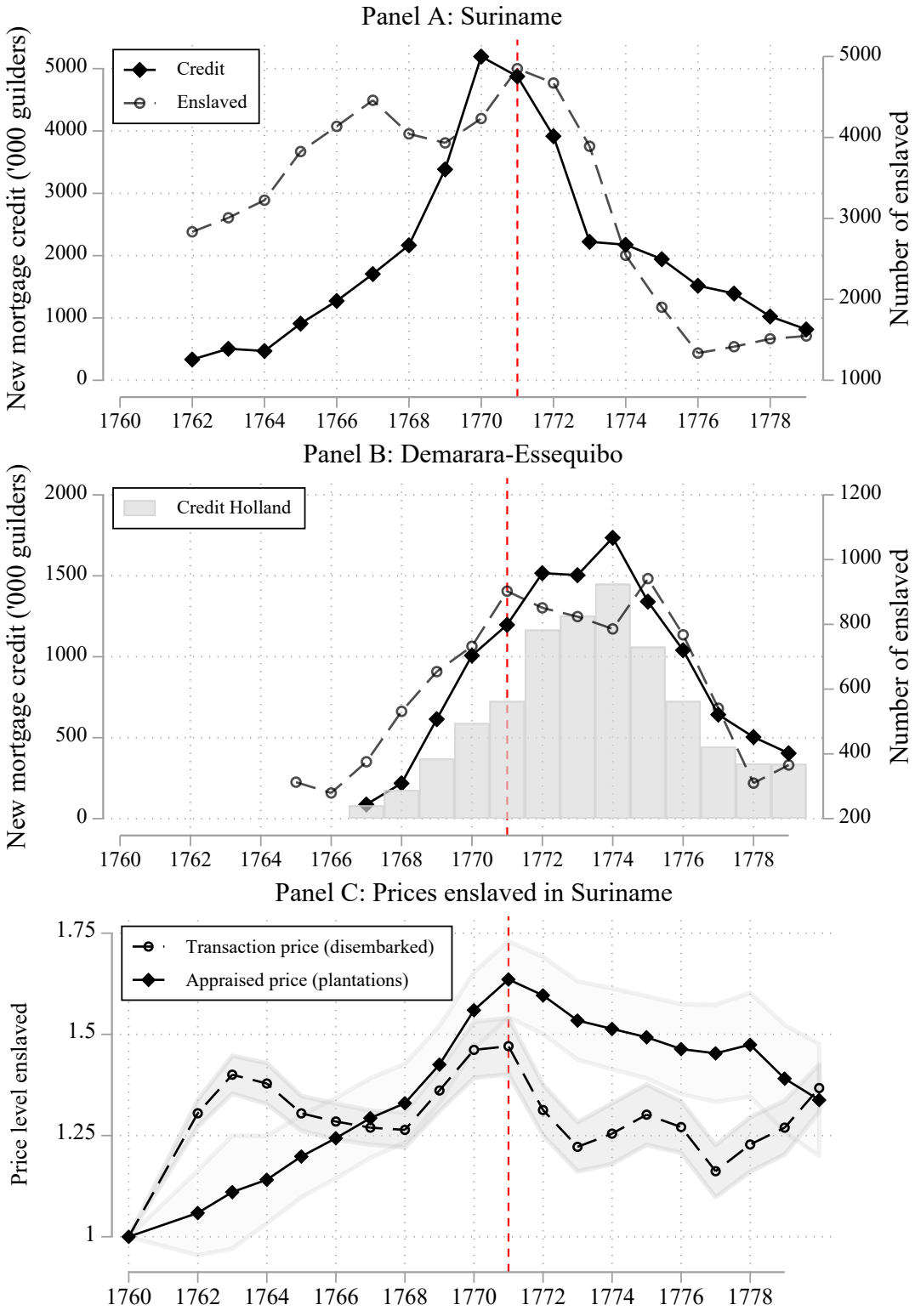
This figure illustrates the number of plantations in our sample, and the total number of enslaved on those plantations. The growth in number of plantations between 1760 and 1771 is due to new plantations being established, and due to older plantations observed for the first time in our sample. The grey line shows the number of enslaved on plantations that we observe from 1760.

Figure 3: Credit growth 1760-1771: extensive and intensive margins



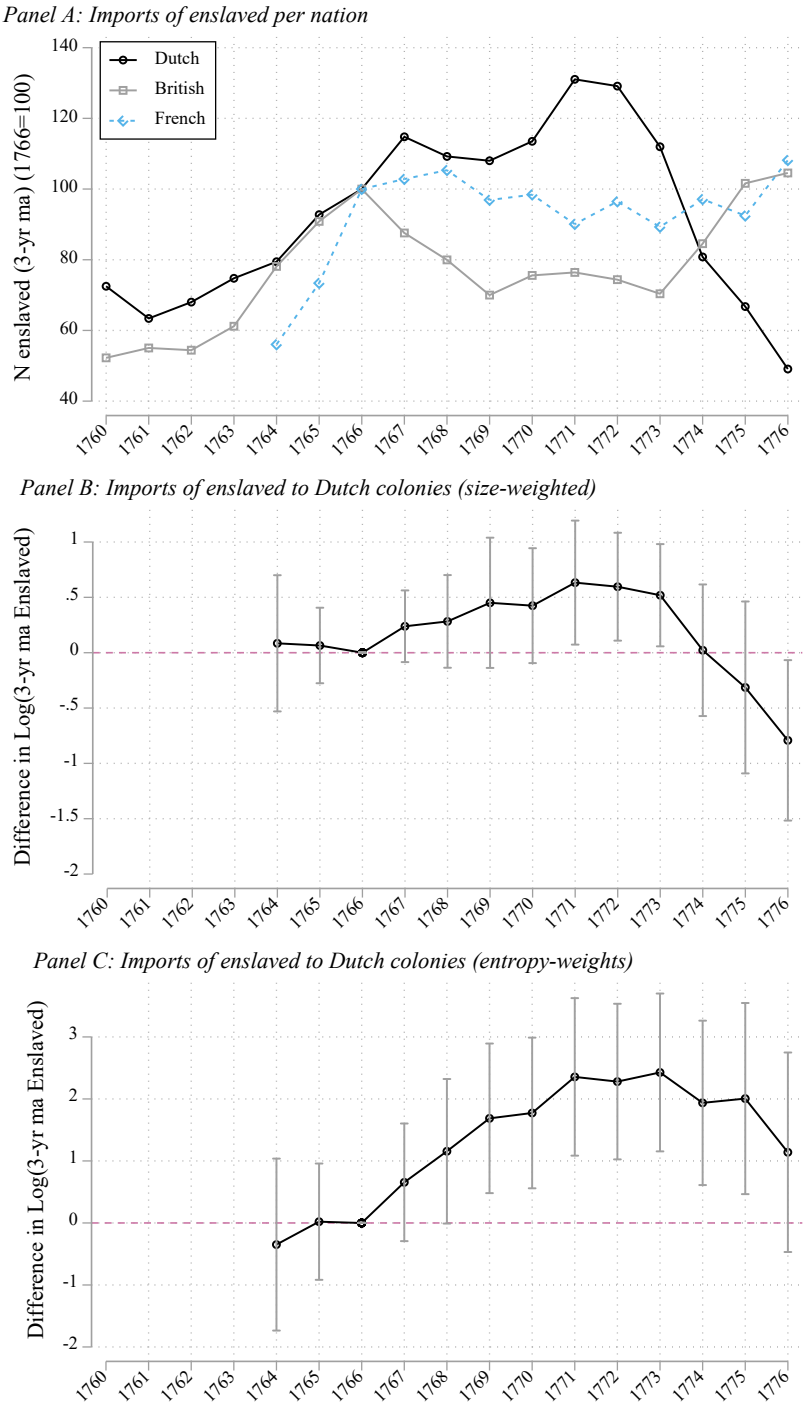
This figure illustrates the extensive and intensive margins of credit growth in Suriname between 1760 and 1771. Panel A shows the proportion of plantations financed with a (post-1750) mortgage. Panel B shows the number of new mortgages (bars) and the average new mortgage sum (connected line) with its 95% confidence interval.

Figure 4: Suriname vs. Demerara-Essequibo



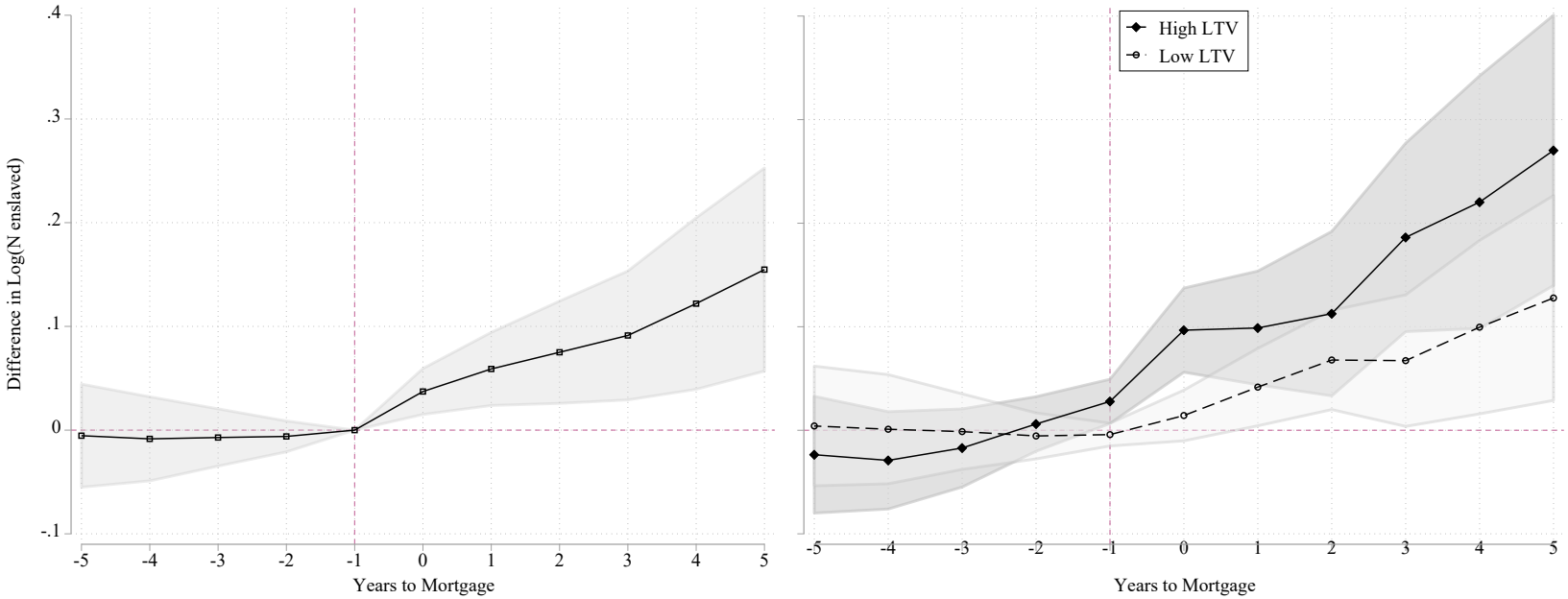
Panel A shows 3-year moving averages of new mortgage credit to Suriname, and the number of imported enslaved people, while Panel B illustrates the same for Demerara-Essequibo. Panel C shows 3-year moving averages of valuations of enslaved present on the plantations, and transaction prices of enslaved newly imported to Suriname.

Figure 5: Dutch vs British and French plantation colonies



This figure compares the import of enslaved between Dutch and other Caribbean plantation colonies. Dutch: Suriname and Demerara-Essequibo. British: Barbados, Jamaica, and the Leeward Islands. French: French Windward Islands (Guadeloupe and Martinique jointly), and Saint-Domingue. We exclude the Danish West Indies because on average less than 3 slave ships arrived per year during our period; we exclude the British Windward Islands because they were mostly newly developed after 1764 when the islands were ceded by the French. The period starts after the end of the Seven Years' War in 1763, and ends in 1776 before the start of the Anglo-French War. Panel A has the 3-year moving average of imports of enslaved, where 1766 = 100. Panels B and C show imports to Dutch colonies relative to the other colonies. We regress the natural log of the 3-year moving average on the interaction of a Dutch colony indicator with year dummies controlling for year and colony fixed effects, with 1766 as the omitted category. Panel B weights colony-year observations by colony size (measured by the natural log of the number of imported enslaved during 1700-1750). Panel C uses entropy weights for means (Hainmueller 2012) based on the proportion of sugar in a colony's total production, and the log number of years between first colonization and 1764. The 95% confidence intervals are based on Newey-West standard errors.

Figure 6: Number of enslaved after plantation mortgage origination

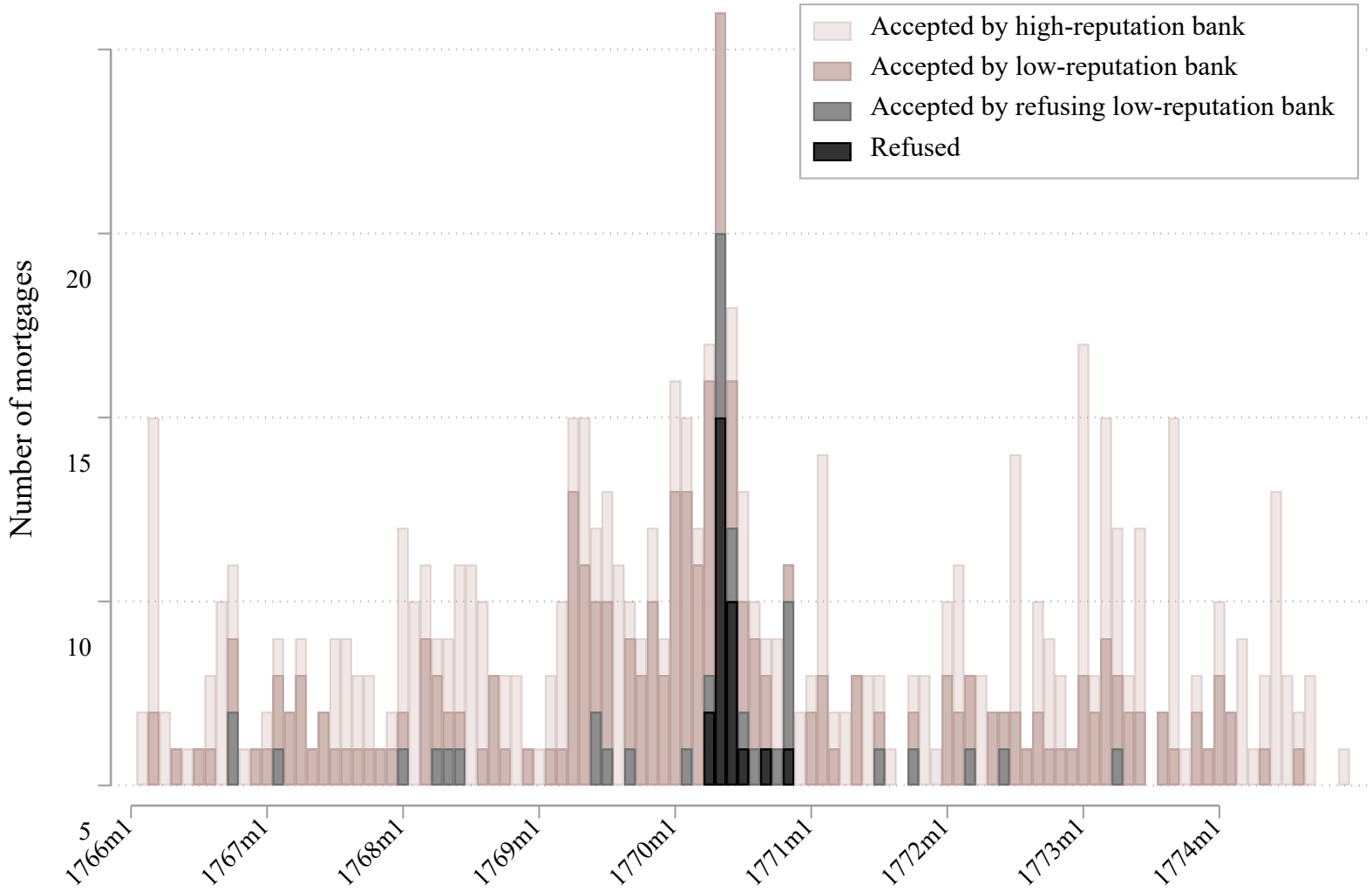


This figure shows staggered two-way fixed effect diff-in-diff estimates of the effect of getting a mortgage on the number of enslaved on a plantation. The sample includes all plantation-year observations for the period 1760-1771. We allow for heterogenous treatment effects following Wooldridge (2021) and estimate:

$$\ln(enslaved_{i,t}) = \sum_{y \in Y} \sum_{t=t_0}^{y-2} \beta_{y,t}^{pre} D_{i,y,t} + \sum_{y \in Y} \sum_{t=y}^{T} \beta_{y,t}^{post} D_{i,y,t} + p_i + \lambda_t + \varepsilon_{i,t},$$

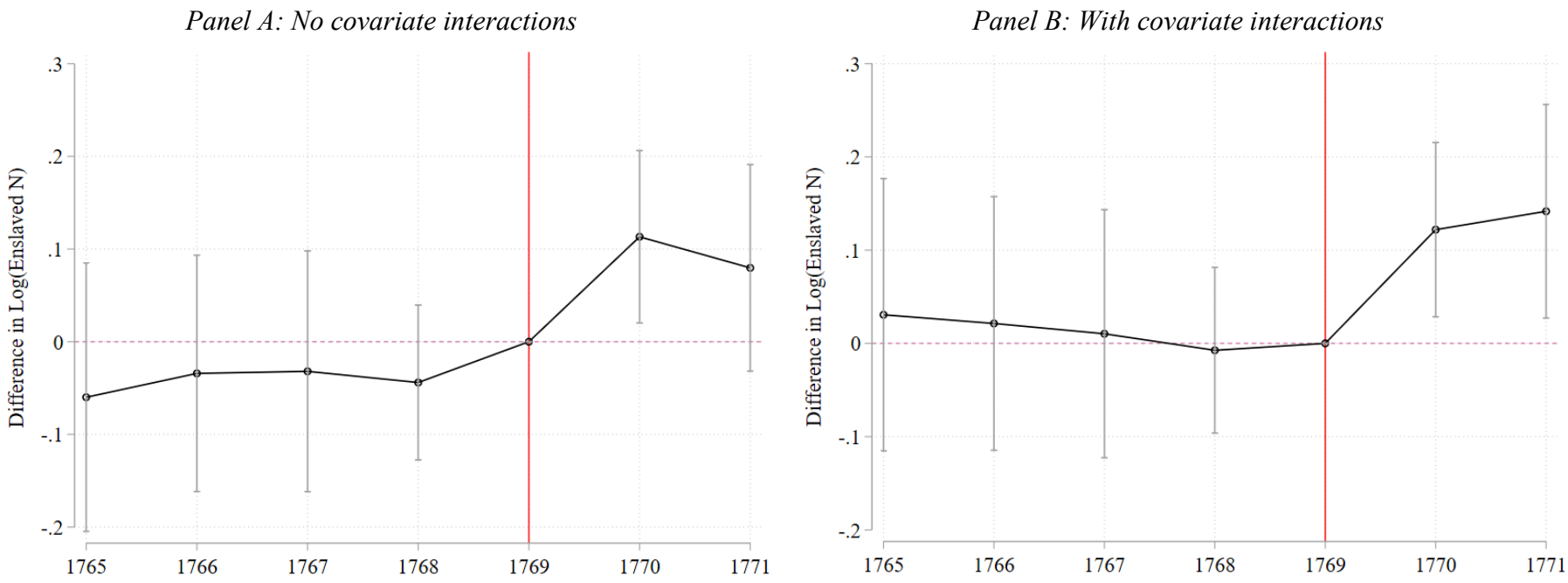
where $enslaved_{i,t}$ is the number of enslaved on plantation i in year t, $y \in Y$ indicates a cohort of plantations that obtain a mortgage in year y, and $D_{i,y,t}$ is a dummy with value 1 if plantation i is part of cohort y and the period is t. Finally, λ_t and p_i are year and plantation fixed effects. Parameters $\beta_{y,t}^{pre}$ capture the pre-trend while $\beta_{y,t}^{post}$ capture the treatment effects. The omitted group consists of plantations that did not get a mortgage (never treated). We then calculate the Average Treatment Effect on the Treated (ATT) by first predicting the outcome variable given the estimates of Eq. (2). We then predict the outcome variable setting $\beta_{y,t}^{pre}$ and $\beta_{y,t}^{post}$ to zero. The difference between the two gives the ATT for each t separately. $y = 0$ is the year of the plantation's first mortgage in the period 1760-1771. High LTV are plantations financed with a mortgage that had an LTV of 5/8 or higher, while Low LTV mortgages are below 5/8. The figure shows 95% confidence intervals estimated by standard errors clustered at the plantation level.

Figure 7: Mortgage refusal shock around April 1770



This figure shows a timeline of Suriname plantation mortgages differentiated by bank type. Refused mortgages were provided by an agent in Suriname but later refused by the bank. Refusing (low-reputation) banks are banks that refused one or more mortgages in the 12 months after April 1770.

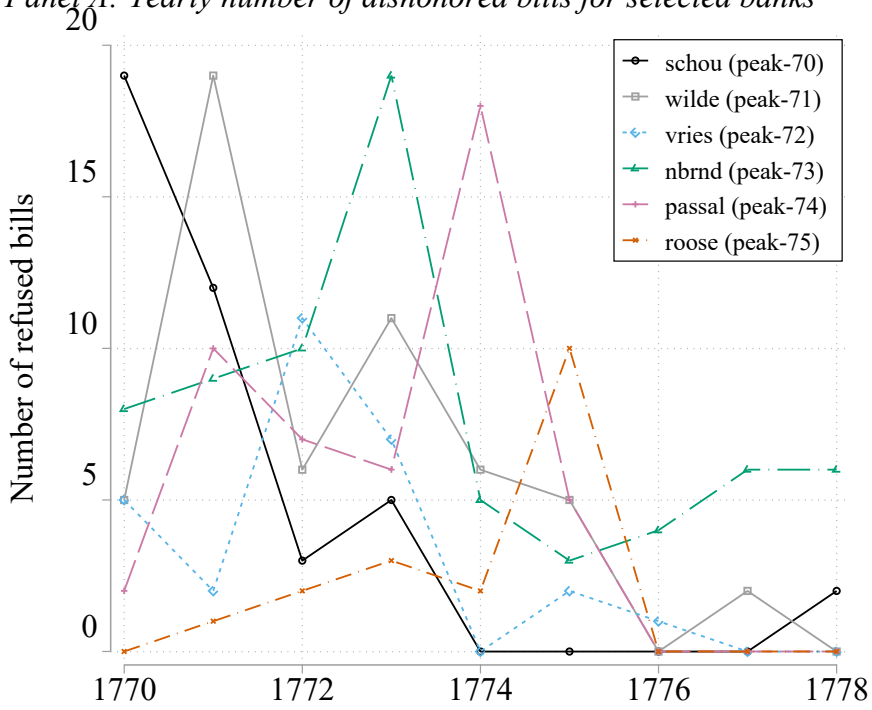
Figure 8: Differences in the number of enslaved people around the 1770 mortgage-refusal shock



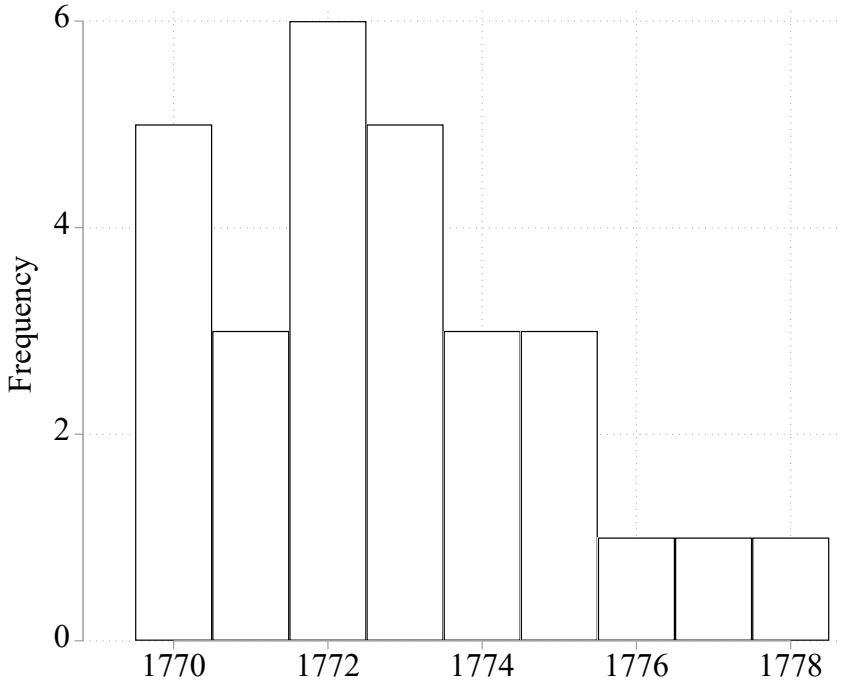
The figure provides reduced form estimates of a standard dynamic two-way fixed effects specification, comparing the number of enslaved on plantations that sought a mortgage during the 12 months before, and 12 months following April 1770 from low-reputation banks that eventually accepted all mortgages, or that refused at least some mortgages in the second quarter of 1770. Panel A has no additional covariates; Panel B controls for interactions between year dummies and the covariates *Office Value, High LTV, Log(Plant age)* and *Log(Enslaved)*, all as of 1769. Unit of observation is a plantation-year. The figure shows 95% confidence intervals, with standard errors clustered at the plantation level.

Figure 9: Staggered timing of banks tightening credit

Panel A: Yearly number of dishonored bills for selected banks



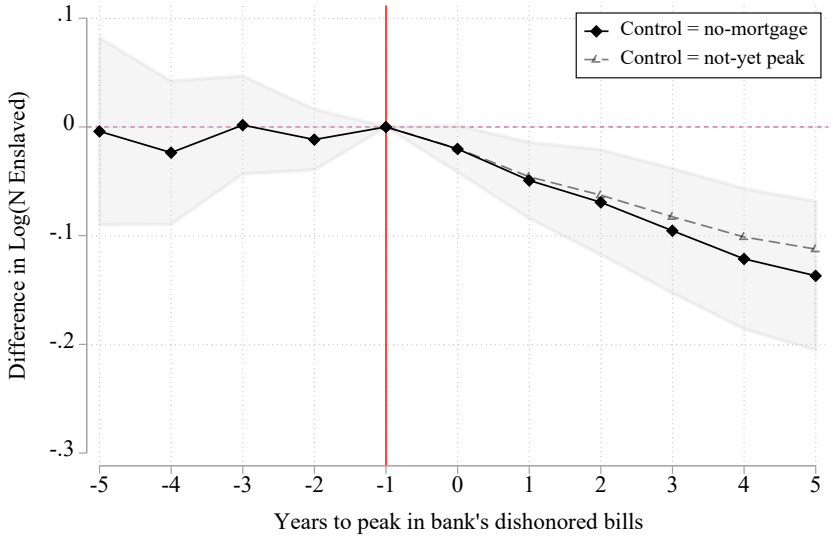
Panel B: Yearly number of banks with peaks in dishonored bills



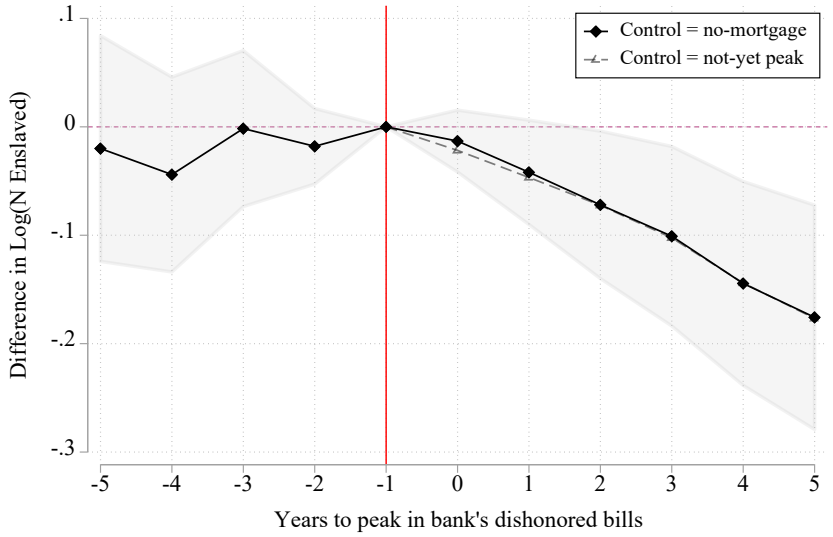
Panel A shows, for a subset of banks, the number of bills of exchange from Suriname they refused for payment. For each bank, we take the timing of the peak as the moment a bank started tightening credit to the planters they were in business with. Panel B shows the number of banks that had a peak in bill refusals in a given year.

Figure 10: Credit tightening

Panel A: No covariate interactions



Panel B: With covariate interactions



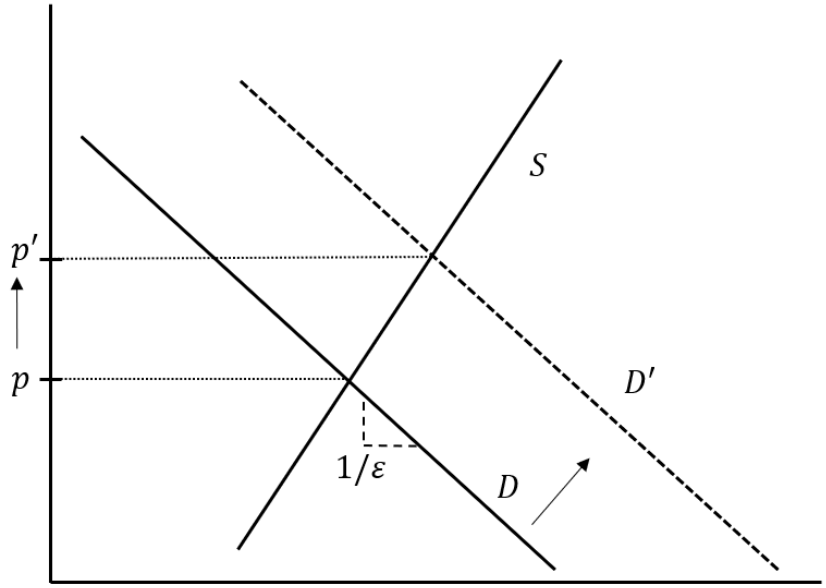
This figure shows staggered two-way fixed effect diff-in-diff estimates of the effect of a bank tightening credit (measured by the peak in refusals of bills of exchange) on the number of enslaved on a plantation. We allow for heterogenous treatment effects following Wooldridge (2021) and estimate:

$$\ln(enslaved_{i,t}) = \sum_{y \in Y} \sum_{t=t_0}^{y-2} \beta_{y,t}^{pre} D_{i,y,t} + \sum_{y \in Y} \sum_{t=y}^{T} \beta_{y,t}^{post} D_{i,y,t} + p_i + \lambda_t + \varepsilon_{i,t},$$

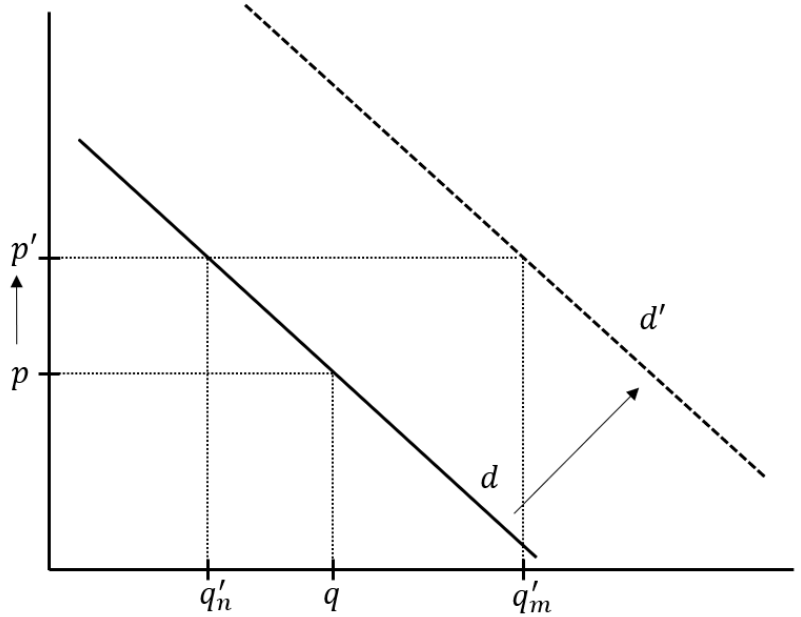
where $enslaved_{i,t}$ is the number of enslaved on plantation i in year t, $y \in Y$ indicates a cohort of plantations for which the bank starts tightening credit in year y, and $D_{i,y,t}$ is a dummy with value 1 if plantation i is part of cohort y and the period is t. Finally, λ_t and p_i are year and plantation fixed effects. Parameters $\beta_{y,t}^{pre}$ capture the pre-trend while $\beta_{y,t}^{post}$ capture the treatment effects. The omitted group consists of either plantations that did not have a mortgage (never treated), or plantations for which their bank did not tighten credit yet (not-yet treated). Using the latter as omitted group, we cannot estimate the pre-trends from the first double summation. We then calculate the Average Treatment Effect on the Treated (ATT) by first predicting the outcome variable given the estimates of Eq. (2). We then predict the outcome variable setting $\beta_{y,t}^{pre}$ and $\beta_{y,t}^{post}$ to zero. The difference between the two gives the ATT for each t separately. $y = 0$ is the year in which a plantation's bank has a peak in refusals. We either include or exclude interactions between covariates *Local* and *Planter experience* and year dummies. The sample includes all plantation-year observations in the period 1769-1780. The figure shows 95% confidence intervals around no-mortgage, with standard errors clustered at the plantation level.

Figure 11: Conceptual framework

Panel A: Aggregate demand and the equilibrium price

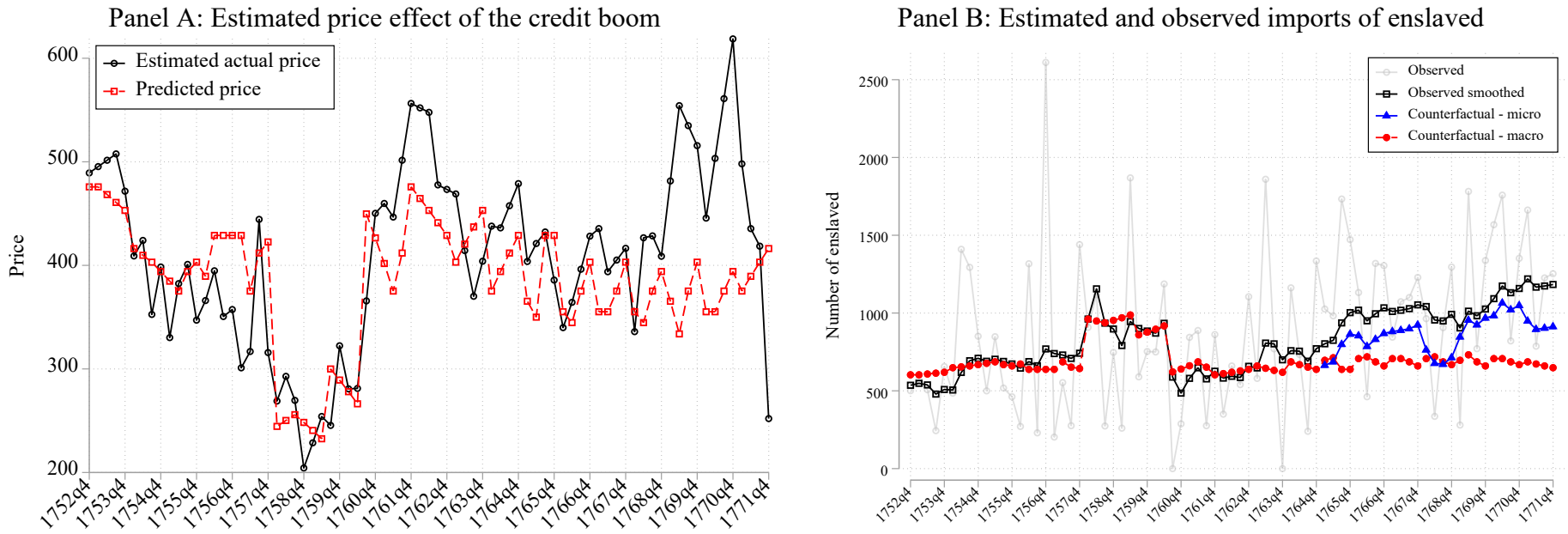


Panel B: Equilibrium price and plantations' demand schedules



Panel A assumes the increase in credit availability leads to an outward shift of the aggregate demand curve D, of which the slope equals the inverse of the elasticity of demand, $1/\varepsilon$. Holding the supply curve constant, this will lead to an increase in the equilibrium price from p to p'. Panel B shows how this price increase affects the imports of enslaved from plantations that obtain a mortgage or not, with respective demand schedules d' and d. The import of enslaved by plantations without a mortgage will decline from q to q_n' reflecting the aggregate price effect. The imports of plantations with a mortgage will increase from q to q_m', which can be decomposed into $q_m' - q_n'$, additional imports due the additional credit driven demand, and $q - q_n'$, a decline in imports reflecting the aggregate price effect.

Figure 12: Aggregate estimates



Panel A compares actual prices for enslaved with prices estimated using insurance premia. We infer the actual price of a newly imported male enslaved by estimating the following pricing model:

$$p_{i,t} = X_{i,t} + \rho_t + u_{i,t}\,,$$

where $p_{i,t}$ is the natural log of the total transaction value of an individual or group of enslaved in transaction i in quarter t. As control variables $X_{i,t}$ we include the natural log of the number of males, females, boys, and girls within that transaction (where we add 1 to deal with zeros). Further, we include indicators for the selling party, for whether the transaction is through auction or private sale and whether the buyer had opportunity for inspection. We include the log of the total number of enslaved individuals on the voyage and the proportion sold on public auction, where we also interact the latter two variables with the indicator variable for whether a transaction was through auction. This controls for the (adverse) selection effect that auction prices were lower when more of the enslaved were already sold through private transactions. The graph plots ρ_t, the quarter fixed effects. The predicted price $\hat{\rho}_t$ is estimated by the first stage regression over the period 1752-1764:

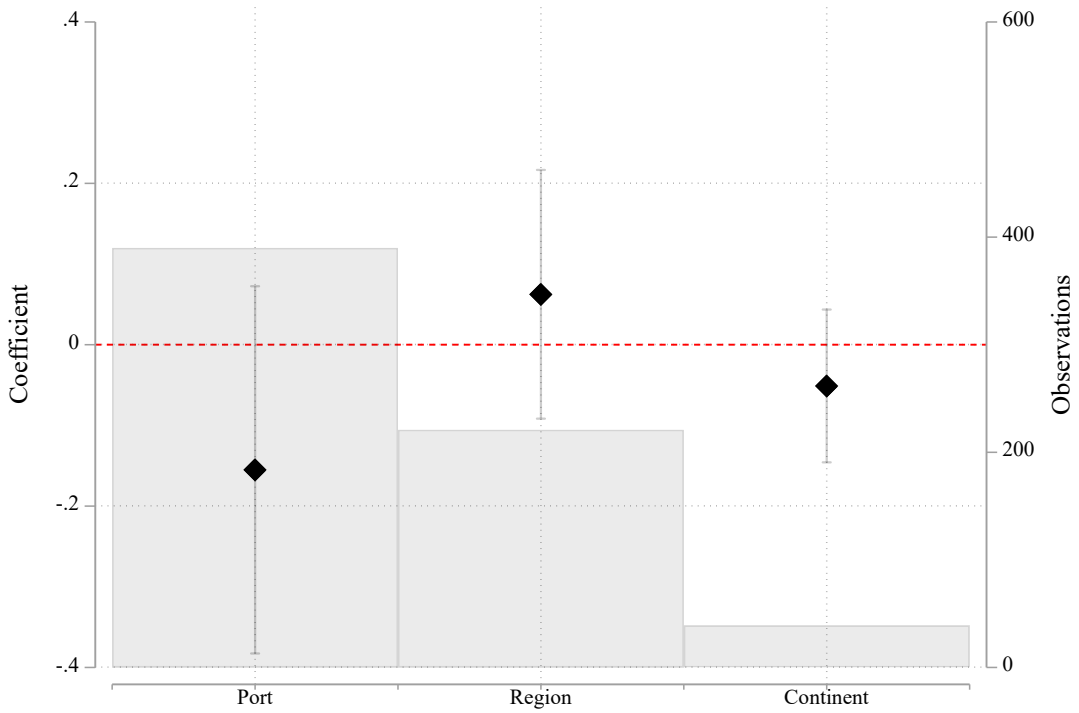
$$\ln(\hat{\rho}_t) = \alpha_0 + \alpha_1\sigma_{t-4} + \alpha_2 W_t + \phi_q$$

where σ_{t-l} is the insurance premium for travel between Amsterdam and Suriname, 4 quarters lagged, W_t indicates war years and ϕ_q are quarter of the year dummies. Panel B compares actual imports of enslaved with counterfactual imports that remove the effect of the mortgage boom. The light grey line shows the quarterly imported number of enslaved people. The black line plots a smoothed estimate using a Kalman filter, where observed imports are decomposed into a persistent trend and transitory noise. The blue line (micro) removes the imports that our plantation level difference-in-difference estimates attribute to the mortgage boom, where we aggregate the difference in imports between mortgage and non-mortgage plantations over the period 1765-1771, while correcting for the price effect of the credit boom. We assume that credit induced imports as a fraction of observed imports are evenly spread across quarters. The red line (macro) predicts imports using the insurance premia using the reduced form regression estimates over the period 1752q4-1764q4:

$$\ln(\hat{Q}_t) = \alpha_0 + \alpha_1\sigma_{t-4} + \alpha_2 W_t + \phi_q.$$

This counterfactual removes any effects from the mortgage boom as long as it is orthogonal to insurance premia.

Figure 13: Crowding-out of imports of enslaved



This figure illustrates the results of a test for crowding-out effects. We estimate the following model:

$$Shipments_{c,\ell,t} = \beta Boom_{\ell,t} + \gamma_{c,\ell} + \delta_t + \varepsilon_{c,\ell,t},$$

where $Shipments_{c,\ell,t}$ is equal to 1 + the natural log of shipments of enslaved people by colonizer *c* (in '000), from African location ℓ, at time *t*. $Boom_{\ell,t}$ is an indicator variable for boom years in locations where the Dutch were active before the start of the boom. The sample period starts from 1764, after the Treaty of Paris ended the Seven Years' War, and the period ends in 1776, before the start of the Anglo-French War. The regression includes colonizer-location fixed effects $\gamma_{c,\ell}$ and δ_t time fixed effects. The region and port-level regressions include observations of location-colonizers if there was at least 1 voyage per year on average within the sampe period. Observations of Dutch shipments of enslaved are omitted. Standard errors are clustered by location-period.

Table 1: Staggered difference-in-difference following mortgage originations

Panel A: Purchases

	(1) ATT	(2) ATT	(3) ATT	(4) ATT
Mortgage	0.054*			
	(0.030)			
HighLTV		0.093**		0.104**
		(0.044)		(0.042)
LowLTV			0.020	-0.022
			(0.031)	(0.034)
Sample	Full	LTVhigh & No-mortgage	LowLTV & No-mortgage	Ex. LTV unknown
N plantations	433	433	433	433
N	5328	4352	4705	4762
R^2	0.19	0.23	0.21	0.22

Panel B: Plantations

	(1) ATT	(2) ATT	(3) ATT	(4) ATT
Mortgage	0.103***			
	(0.031)			
HighLTV		0.137***		0.135***
		(0.037)		(0.038)
LowLTV			0.064**	0.071**
			(0.031)	(0.035)
Sample	Full	HighLTV & No-mortgage	LowLTV & No-mortgage	Ex. LTV unknown
N plantations	394	394	394	394
N	4296	3479	3499	3811
R^2	0.92	0.94	0.93	0.93

This table shows staggered two-way fixed effect diff-in-diff estimates of the effect of getting a mortgage on plantations' slave purchases from the MCC and Coopstad & Rochussen (Panel A) or the number of enslaved on a plantation (Panel B). We allow for heterogenous treatments and show ATT estimates following Wooldridge (2021). For Panel A, we take the natural log of 1 + the number of enslaved people purchased per year. The data includes purchases from slave traders MCC and Coopstad & Rochussen. For Panel B, we take the natural log of the number of enslaved present on a plantation in a given year. The omitted group consists of plantations that have not yet obtained a mortgage (not-yet treated). *Mortgage* indicates plantations having mortgage finance. *HighLTV* indicates plantations financed by a mortgage with an LTV of 5/8 or higher, while *LowLTV* indicates an LTV below 5/8. The full sample is a panel of all plantation-year observations over the period 1760-1771. The sample in Column 2 excludes observations once a plantation has obtained a mortgage that is not identified as having a high LTV. The sample in Column 3 excludes observations once a plantation has obtained a mortgage that is not identified as having a low LTV. The sample in Column 4 excludes plantations for which we do not have the LTV. Standard errors are clustered at the plantation level and reported in parentheses. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 2: Mortgage refusals and bank, plantation and planter characteristics

	Refusing banks			*Accepting banks*				
	N	Mean	Sd.	N	Mean	Sd.	Mean dif.	t-stat
Panel A: Banks								
Prop. Mortgages in event wind. (12-months around April 1770)	31	0.86		68	0.85		0.01	0.16
Prop. Mortgages post-April 1770 cutoff (in event wind.)	31	0.61		68	0.10		0.51	3.91
Bank Office Value	31	0.72	0.10	68	0.62	0.14	0.09	2.02
MBS vol.	31	1,005	344	68	1,338	800	-333	-0.87
Log(MBS vol.)	31	6.85	0.37	68	6.57	1.99	0.28	0.43
MBS experience	31	2.74	1.21	68	2.32	1.66	0.42	0.53
Panel B: Plantations								
Mortgage (1/0)	31	0.74		68	0.84		-0.10	-1.12
High LTV (1/0)	31	0.32		68	0.51		-0.19	-1.79
Low LTV (1/0)	31	0.42		68	0.32		0.10	0.92
Plantation age (years)	31	71.55	32.93	68	57.09	31.00	14.46	2.11
Log(Plantation age)	31	4.12	0.68	68	3.86	0.73	0.26	1.71
N enslaved	31	81.04	38.23	68	104.84	49.74	-23.80	-2.36
Log(N enslaved)	31	4.26	0.57	68	4.50	0.61	-0.24	-1.87
Acres	31	1,321	1,426	68	898	825	423	1.86
Log(Acres)	31	6.62	1.11	68	6.46	0.83	0.16	0.79
Enslaved-acres ratio	31	0.15	0.12	68	0.18	0.12	-0.03	-1.30
Sugar (1/0)	31	0.23		68	0.24		-0.01	-0.10
Upland (1/0)	31	0.71		68	0.57		0.14	1.29
Panel C: Planters								
Local (1/0)	30	0.83		68	0.81		0.02	0.29
Administration (1/0)	30	0.07		68	0.15		-0.08	-1.11
Planter experience	30	2.17	0.91	68	2.17	1.04	0.00	0.00

This table compares characteristics of plantations seeking a mortgage during the 24 months around April 1770 from a low-reputation bank that eventually accepted all mortgages ("accepting bank"), or banks that refused at least some mortgages in the second quarter of 1770 ("refusing bank"). The table shows 1769 statistics. Panel A compares accepting and refusing banks. *Prop. Mortgages in event wind* is the proportion of the bank's mortgages that were issued during the event window (24-months around April 1770). *Prop. Mortgages post-April 1770 cutoff* is the proportion of the bank's mortgages during the event window, that was issued after April 1770. *Bank Office Value* is the annual rental value of the bank's office premises. *MBS vol.* is the bank's total MBS volume. *MBS experience* is the number of years since the bank's first plantation MBS issue. Panel B compares plantations. *Mortgage* indicates plantations that obtained mortgage finance. *High LTV* indicates plantations financed with a mortgage that had an LTV of 5/8 or higher, while Low LTV indicates below 5/8 LTVs. *Plantation age* is the natural log of the age of the plantation in years. *N Enslaved* is the number of enslaved on the plantation. *Acres* is the size of the plantation in acres. *Sugar* indicates sugar plantations. *Upland* indicates plantations situated in districts upriver further from the coast (Bovendivisie Commewijne, Bovendivisie Cottica, Thorarica). Panel C compares planters. *Local* is equal to 1 for planters living in Suriname and equal to 0 for planters residing in Europe. *Administration* indicates planters with a position in the colonial administration. *Planter experience* is equal to the natural log of the number of plantation-years an individual was owner + 1.

Table 3: Mortgage refusals – OLS and IV estimates

	(1) Log(N enslaved 1770)	(2) Log(N enslaved) 1770	(3) Mortgage accepted	(4) Log(N enslaved 1770)
Mortgage accepted	0.153**			0.197**
	(0.059)			(0.083)
Accepting bank		0.121**	0.615***	
		(0.051)	(0.074)	
Spec	OLS	Reduced	1st stage	2nd stage
Bank controls	Yes	Yes	Yes	Yes
Plantation controls (as of 1769)	Yes	Yes	Yes	Yes
Planter controls	Yes	Yes	Yes	Yes
River	Yes	Yes	Yes	Yes
N	98	98	98	98
R^2	0.93	0.93	0.68	0.93
F-stat			68.5	
F-stat K-P			68.5	
LM p-value			0.000	
AR p-value			0.021	

This table shows IV estimates. Unit of observation is a plantation that sought a mortgage from a low-reputation bank in the 24 months around April 1770. Column (1) shows a simple OLS regression of mortgage acceptance on the number of enslaved people on a plantation at the end of 1770. Column (2) shows the reduced form estimate of the effect of having a mortgage originated by an "accepting" bank on the number of enslaved people. An accepting bank accepted all mortgages provided by their agent, while the remaining refusing banks eventually refused at least some mortgages. Column (3) shows the first stage IV estimate of the effect of having a mortgage originated by an accepting bank on the actual mortgage acceptance. Column (4) shows the second stage IV estimate. Bank control variables include *Bank Office Value, Log(MBS vol.),* and *Market entry.* Plantation control variables include *High LTV*, *Low LTV, Sugar, Log(Plantation age), Log(Acres), Log(Enslaved)* and *Upland*, all as of 1769. Planter control variables include *Local, Administration,* and *Planter experience*. Standard errors are clustered at the plantation level and reported in parentheses. *, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively. P-values of instrument LM underidentification and Anderson-Rubin F-test of endogenous regressors are reported.

Table 4: Peak in refused bills of exchange and plantation and planter characteristics: hazard model

	N	Mean	SE	z-score
N enslaved	339	1.00	0.00	-1.24
Log(N enslaved)	339	0.98	0.07	-0.24
LTV	127	0.76	0.33	-0.63
Sugar	339	1.13	0.15	0.94
Plantation age	339	1.00	0.00	0.35
Log(Plantation age)	339	1.00	0.09	-0.03
Acres	334	1.00	0.00	-0.46
Log(Acres)	334	0.93	0.06	-1.11
Upland	339	1.12	0.12	1.03
Local	306	1.44	0.19	2.79
Administration	309	1.07	0.19	0.40
Planter experience	309	0.88	0.05	-2.25

This table shows estimates of a hazard model testing how plantation characteristics relate to the timing of a bank's peak in refusals of bills of exchange. The full sample includes all plantations and is right censored in 1778. A lower hazard means a later peak. *N Enslaved* is the number of enslaved people on the plantation. *LTV* is the loan-to-value ratio. *Sugar* indicates sugar plantations. *Plantation age* is the age of the plantation in years. *Acres* is the size of the plantation in acres. *Upland* indicates plantations situated in districts upriver further from the coast (Bovendivisie Commewijne, Bovendivisie Cottica, Thorarica). *Local* is equal to 1 for planters from Suriname, and 0 for planters residing in Europe. *Administration* indicates planters with a position in the colonial administration. *Planter experience* is equal to the natural log of the number of plantation-years that an individual was owner + 1.

Table 5: 2SLS estimates of the demand elasticity for enslaved imports

	(1) Log(Imports)	(2) Log(Imports)	(3) Log(Price)	(4) Log(Imports)
Log(Price)	-0.304**			-0.546**
	(0.119)			(0.217)
Log(L4.Premium)		-0.253**	0.464***	
		(0.100)	(0.137)	
War	0.222***	0.414***	-0.570***	0.103
	(0.053)	(0.046)	(0.056)	(0.091)
Spec	OLS	Reduced	1stage	2nd stage
Quarter	Yes	Yes	Yes	Yes
N	49	49	49	49
R^2	0.74	0.72	0.71	0.70
F-stat			11.41	

This table presents instrumental variables estimates of the demand elasticity of slave imports to slave prices. The sample period is 1752q4-1764q4. Column (1) reports OLS estimates. Imports is the quarterly number of enslaved people imported to Suriname, smoothed using a state-space model estimated with a Kalman filter, which decomposes observed imports into a persistent trend component and transitory noise. Price is linearly interpolated for missing values. War indicates the period 1758q1-1760q2, the height of naval battle in the Seven Years War. Column (2) shows the reduced form estimate of the effect of L4.Premium, the insurance premium lagged by four quarters, on imports. Columns (3) and (4) have the first and second stage from 2SLS. All specifications include quarter of the year fixed effects. Standard errors are reported in parentheses. The F-statistic tests the joint significance of excluded instruments in the first stage. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

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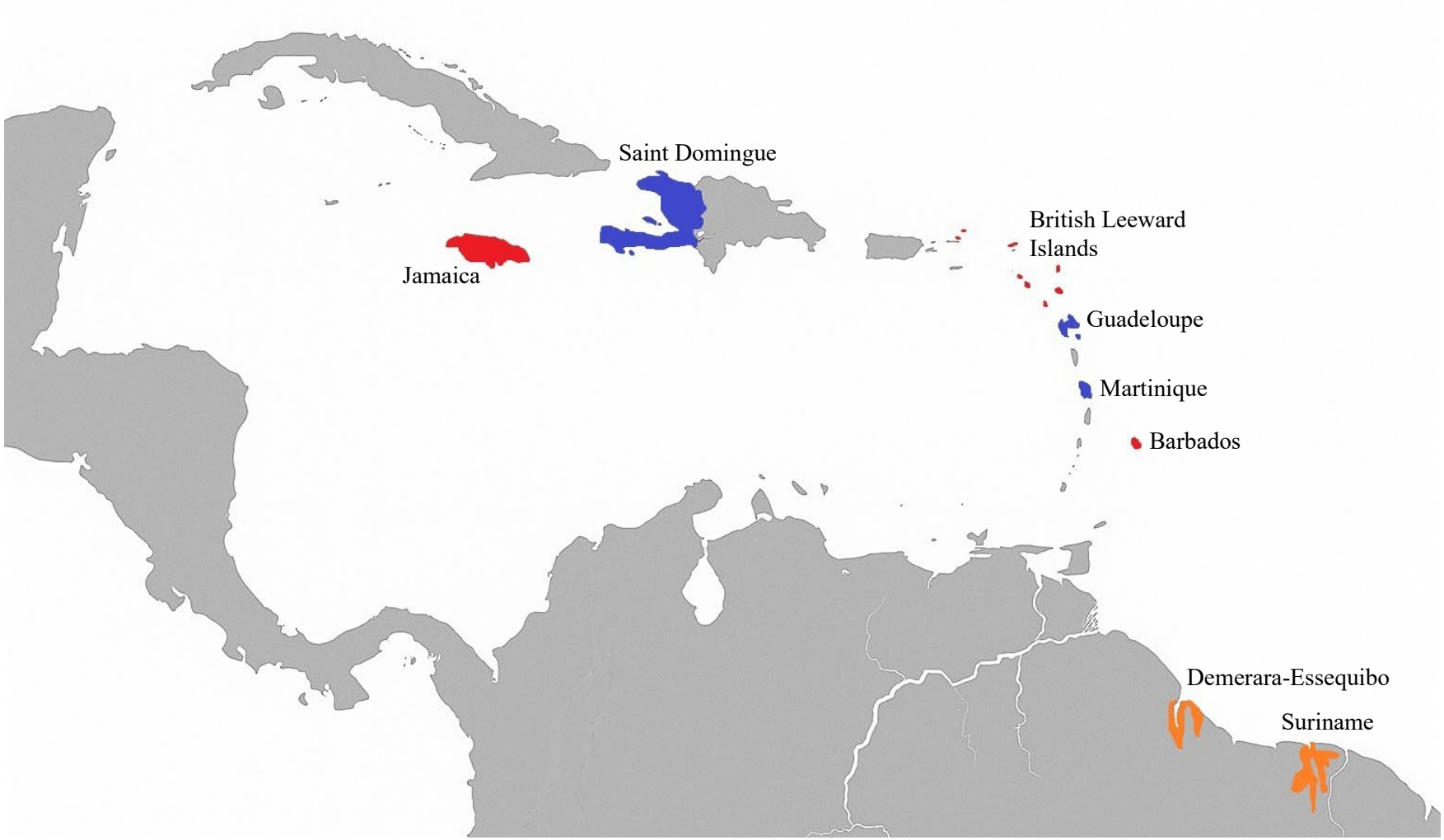
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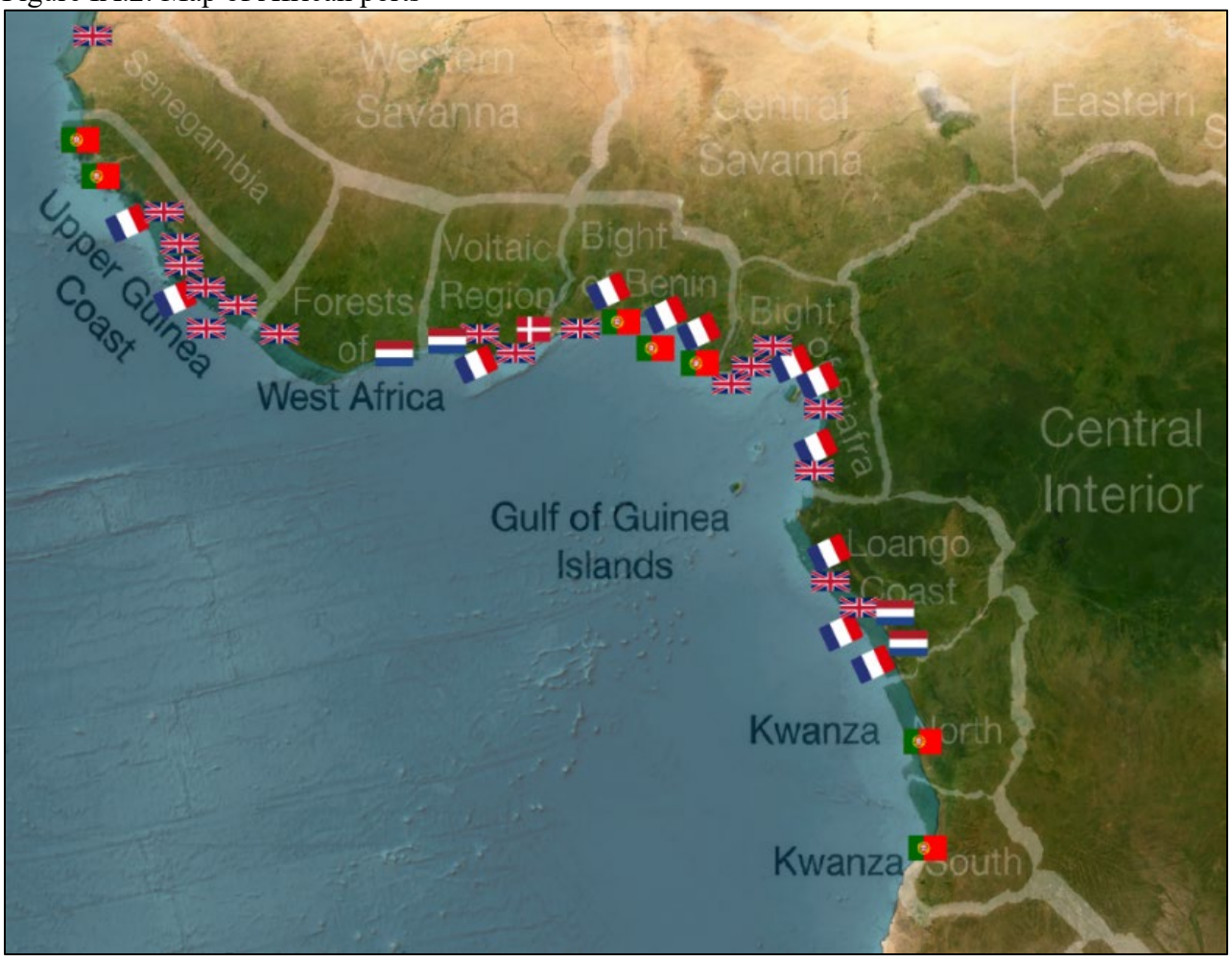
A. Maps

Figure IA.1: Map of the Caribbean



This figure shows a stylized map of the Caribbean colonies that we consider in the analysis. Red: British; Blue: French; Orange: Dutch.

Figure IA.2: Map of African ports



This figure shows a map of African regions and ports from which the European nations England, Portugal, France, the Dutch Republic and Denmark forcibly shipped enslaved individuals to the Americas between 1760 and 1780. The African regions are based on Lovejoy et al. (2019).

B. Sources and data construction

B.1. Plantations (numbers of enslaved)

The data on yearly numbers of enslaved people on plantations comes from reports of the Suriname administration, and from plantation appraisal reports. We provide examples of the source material used to construct our database at the end of this section in Figures IA.4a through IA.4e.

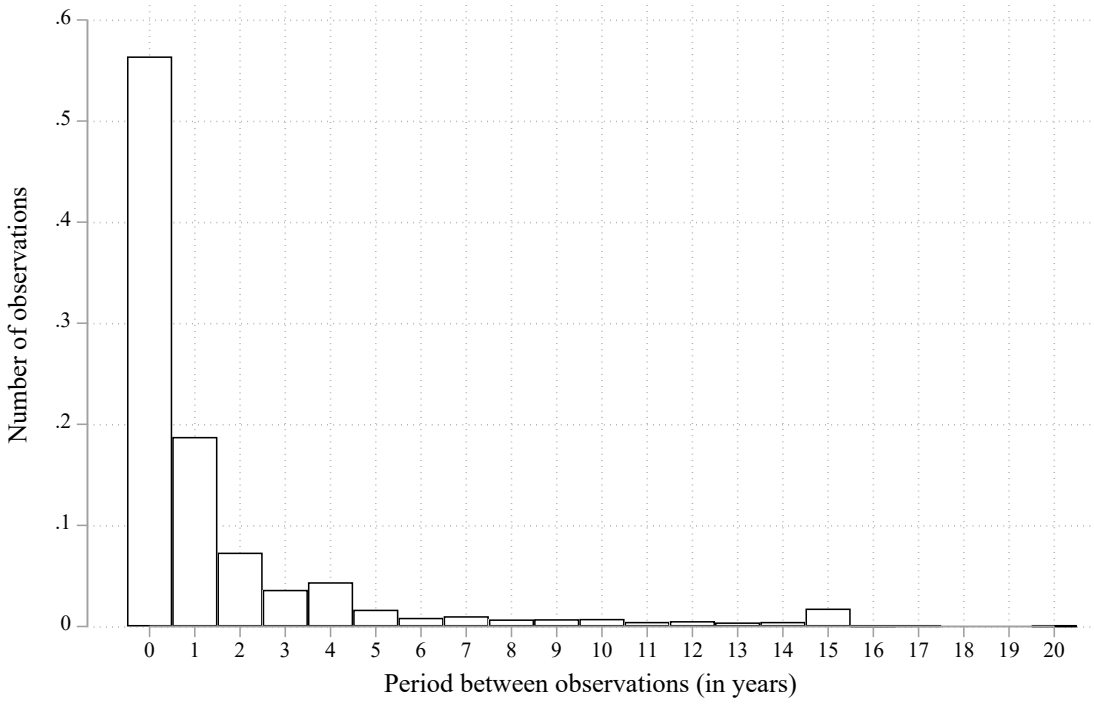
For 1752 and 1754, we use complete lists of all plantations in Suriname, and the total number of enslaved people on each plantation, submitted by the *Societeit van Suriname* to the Stadtholder and Admiral-General of the United Netherlands, the Prince of Orange. [23] For the period 1770–1780, we use reports of the local militias of each of the districts of Suriname. These reports on the number of enslaved people on each plantation within the district, were provided to the central colonial administration.[24] The purpose of these reports was to establish the number of enslaved people that each plantation was required to contribute to the militias, whom were fighting the marrons that held up in the jungle. To staff the militias each plantation was required to send a number of men depending on plantation size. An example of these reports is in Figure IA.4a.

For the years in between, we use plantation appraisal reports, that provide detailed information on the various assets held by each plantation, including the land, crops, buildings, and enslaved people. The standardized reports include a name list of the enslaved people, divided into four categories: men, women, boys and girls.[25] De Jong, Kooijmans, and Koudijs (2025) provide details on the other plantation assets included in the appraisal reports. We have supplemented our own appraisal report database with data collected by Philip Dikland.[26] In total we have data from 3050 (2875) appraisal reports over the period 1740-1780 (1750-1780).

For missing plantation-years, we linearly interpolate the number of enslaved people on the plantation. Figure IA.3 illustrates the gaps, the length of periods between observations on the number of enslaved people on the plantation.

[23] Dutch National Archives, Archive of the Sociëteit van Suriname, 1650-1796 (1.05.03), 293, 295.
[24] Dutch National Archives, Archive of the Hof van Politie en Criminele Justitie in Suriname, 1669-1828 (1.05.10.02), 581-585.
[25] Dutch National Archives, Notarial Archives of Suriname 1699-1845 (1.05.11.14), 205–253; 692-708. City Archives Amsterdam, Collection of the Amsterdam Notaries 1578-1915 (5075).
[26] We thank Philip Dikland for generously sharing his database.

Figure IA.3: Length of periods between observations on the same plantation



This figure illustrates the length of periods between two observations on the number of enslaved people on the same plantation over the period 1754-1780.

B.2. Mortgage credit

We reconstruct credit flows to plantations in Suriname using (handwritten) mortgage deed records that we manually collected from notarial archives in Suriname and Amsterdam.[27] Each deed specifies the details of the contract, such as the mortgage date; the name and location of the plantation; the names of the borrower and lender; the mortgage sum, maturity, and interest rate; and the appraised value of the plantation. We combine the mortgage principal and the appraisal to compute the loan-to-value (LTV) ratio. De Jong, Kooijmans, and Koudijs (2025) provide additional detail on the structure and interpretation of these deeds. In total we have 444 mortgages, extended over the period 1760-1771.

[27] Dutch National Archives, Notarial Archives of Suriname 1699-1845 (1.05.11.14), 118-128; 337-394; 716-736; 919. City Archives Amsterdam, Collection of the Amsterdam Notaries 1578-1915 (5075).

To reconstruct aggregate credit flows to Demerara-Essequibo, we collect all mortgage deeds from the National Archives of Guyana, Public Record Office in London, and the Notarial Archives of Amsterdam.[28]

B.3. Transaction prices enslaved

We collect data on transaction prices of enslaved people imported to Suriname from the archives of two large slave traders: the Middelburgse Commercie Compagnie and Coopstad & Rochussen, and we collect transaction data from records of public auctions of the Suriname administration.[29] The two slave traders jointly cover about 30% of all slave voyages to Suriname during our period.

After arriving in Suriname, slave traders commonly first started to sell people in private transactions, that allowed buyers to pick their preferred individuals. In these transactions, plantations commonly bought multiple people in one transaction. In this case, our dataset has the total price for the group of individuals, where people are divided into four categories: men, women, boys and girls. Commonly, the remaining individuals were brought to public auction. Most transactions on public auctions were per individual. In total, we have 14,080 transactions of 20,762 individuals over the period 1760-1780. Figure IA.4b has an example of slave trader administration. Figure IA.4c has an example of a public auction record.

B.4. Refusals of mortgages and bills

We build a dataset of bills of exchange that were drawn in Suriname on the merchant banks in our sample, but eventually dishonored, using the Amsterdam notarial archives.[30] The plantations used bills of exchange to draw money on their bank in Amsterdam, and in this way settle their transactions, such as purchases of enslaved. A bill stated that its final holder would be paid a certain amount of money in Amsterdam at a given point in time (usually 6 weeks or 3 months after presenting the bill at the bank).

Once a plantation had obtained a mortgage, it could draw bills on the merchant bank up to the mortgage principal. Additional drawings may be booked to the plantation's current account with

[28] National Archives of Guyana, AZ 3/1-2, AZ 4/2-8, AZ 5/3-7, AZ 12/1-5. The National Archives, Kew, Public Record Office CO 116/37. City Archives Amsterdam, Collection of the Amsterdam Notaries 1578-1915 (5075).
[29] Zeeland Archives, Archive of the Middelburgsche Commercie Compagnie (MCC), 1720-1889, 167-1439. City Archieves Rotterdam, Archives of the firms Coopstad & Rochussen, Ferrand Whaley & Jan Hudig, 12-101. Dutch National Archives, Archive of the Sociëteit van Suriname, 1650-1796 (1.05.03), 292-372. Dutch National Archives, Archive of the Gouvernementssecretarie der Kolonie Suriname, 722-1828 (1.05.10.01), 87, 90, 99, 101,105, 401.
[30] Amsterdam City Archives, Collection of the Amsterdam Notaries, 1578-1915 (5075).

the bank. In all cases, there was always the risk that the bank would refuse payment. Non-payment typically reflected that the bill had not been supported by the bank's agent in Suriname, that the drawer lacked sufficient credit, or that the bank faced liquidity constraints. When a bill was dishonored, the holder would file a formal "protest" with an Amsterdam notary; the protested bill was then returned to the colony, where the original drawer became liable for a 25% penalty.

The notarial archives of Amsterdam provides an index to about 30% of all notarial deeds. We identify all deeds of protests of bills from Suriname over the period 1760-1780, drawn on the banks in our sample. We collect detailed data for all bill protests from the five most active notaries on Suriname. This includes information on the plantation, sum, and date. Based on this data, we identify mortgages that were approved by bank's agents, but eventually refused for payment by the bank. An example of a bill of exchange protest is in Figure IA.4d.

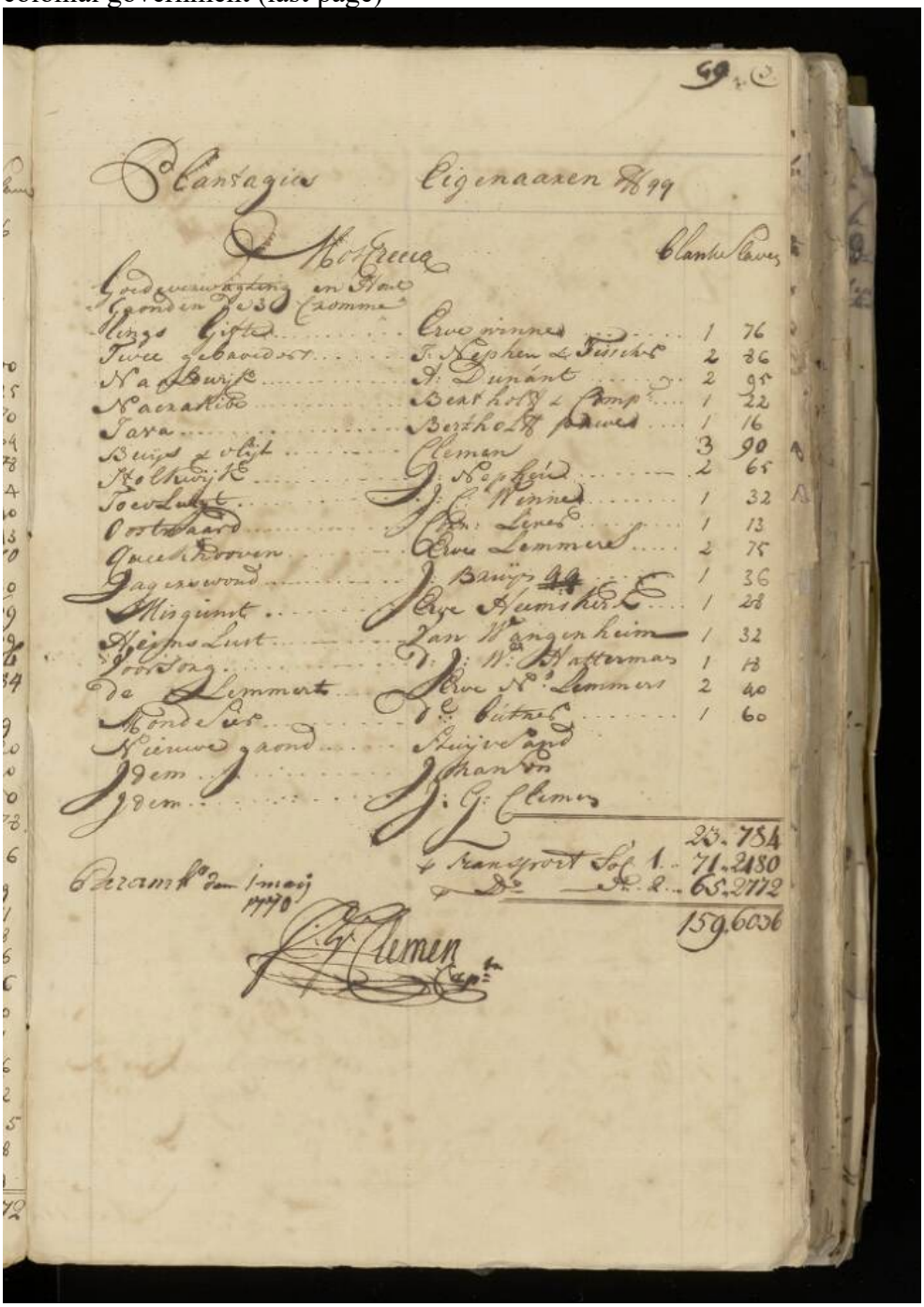
B.5. Insurance premia

The source of our data on insurance premia are 'prijs couranten', financial leaflets publishing price series in Amsterdam. The papers contained financial market data, such as security prices, interest rates, exchange rates, etc. We use insurance premia quoted in the Amsterdam underwriting market for ships setting sail to Suriname. Since the prevailing winds steered ships to Suriname past West-Africa, this closely approximates the premia that slave traders would have paid. We obtain the data for the period 1766-1771 from Spooner (1983), which was collected from the same source, and we supplement the series with data for the period 1752-1765.[31]

In some cases, the newspaper provides a small bandwidth of premia, in this case we follow Spooner (1983) and take the upper bound. We transform the data to quarterly data, by first defining quarters based on shipping seasons. The first quarter runs from February to April, etc. For each quarter, we take the mean of observed premia during that quarter. In case of missing insurance premia-quarters we linearly interpolate. Figure IA.4e has an example of insurance premia of the prijscourant.

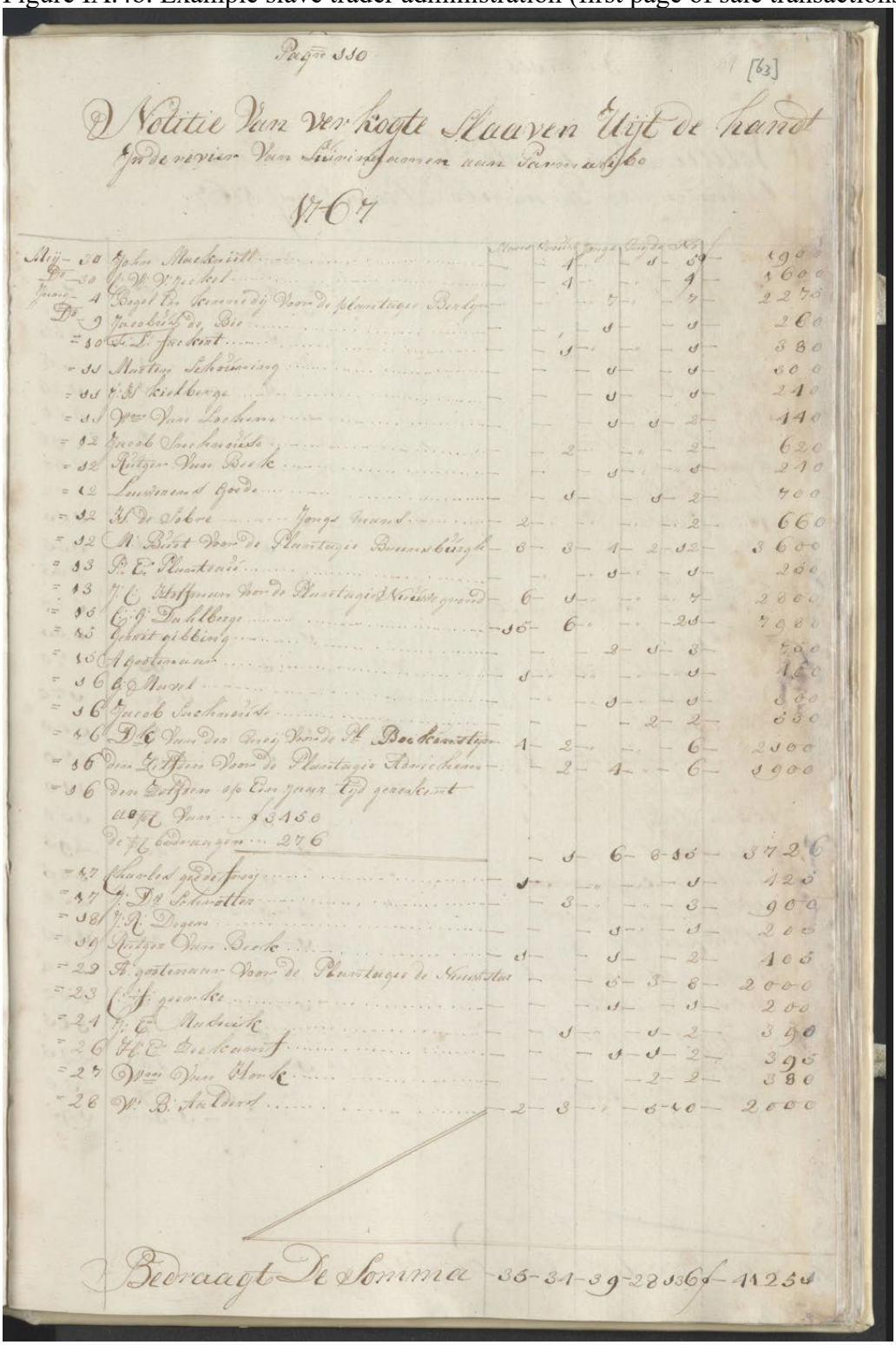
[31] International Institute of Social History (Amsterdam), NEHA Collection, Commercial and financial serial publications (472, ARCH03972). International Institute of Social History (Amsterdam), NEHA Collection, Commercial and financial serial publications (tweede aanvulling) 1585-1807 (674, ARCH04174).

Figure IA.4a. Example report on numbers of enslaved per plantations by district officers to colonial government (last page)



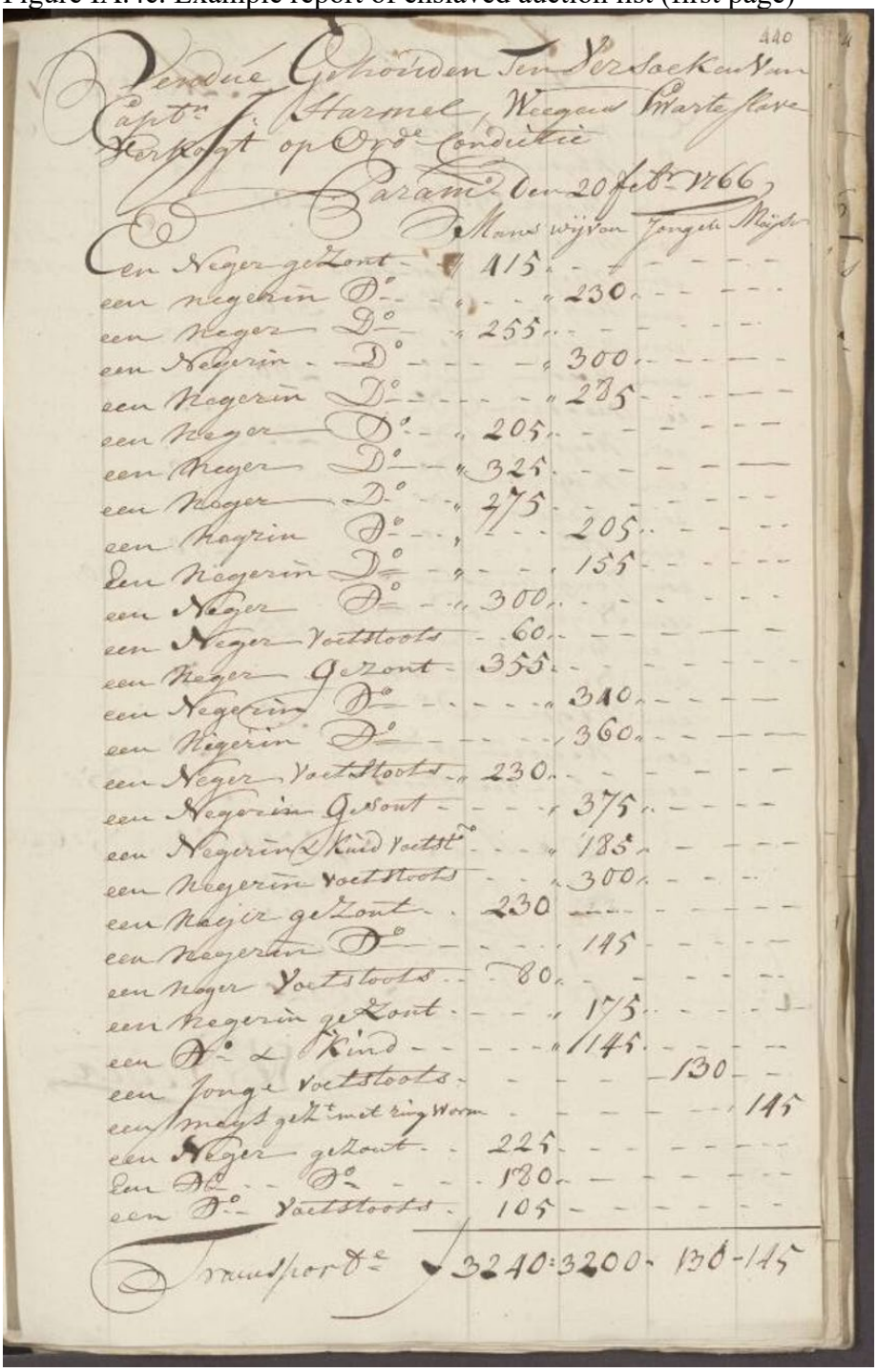
Source: Dutch National Archives, Archive of the Hof van Politie en Criminele Justitie, 1669-1828 (1.05.10.02) 581.

Figure IA.4b. Example slave trader administration (first page of sale transactions)



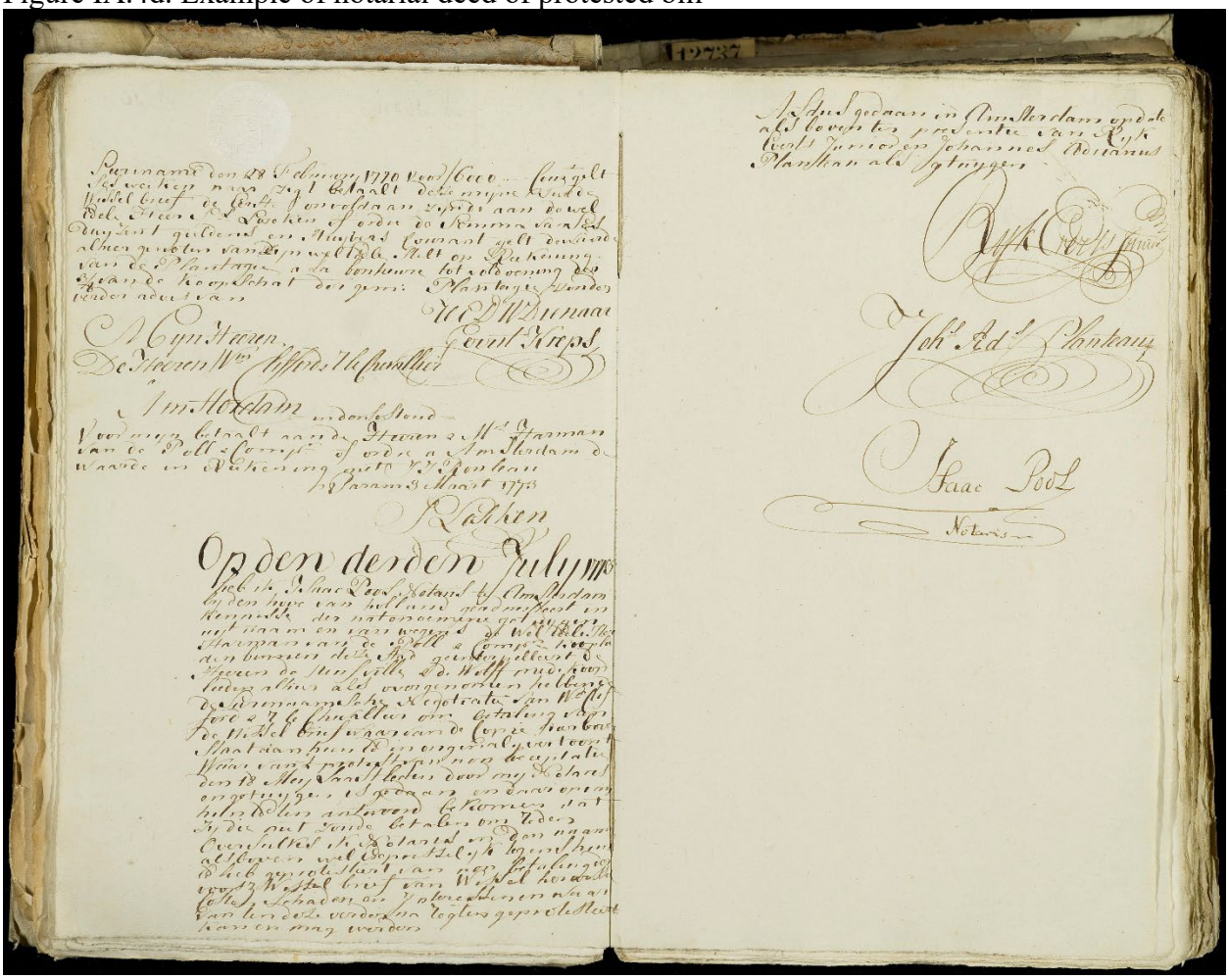
Source: Zeeland Archives, Archive of the Middelburgsche Commercie Compagnie (MCC), 1720-1889, 400.

Figure IA.4c. Example report of enslaved auction list (first page)



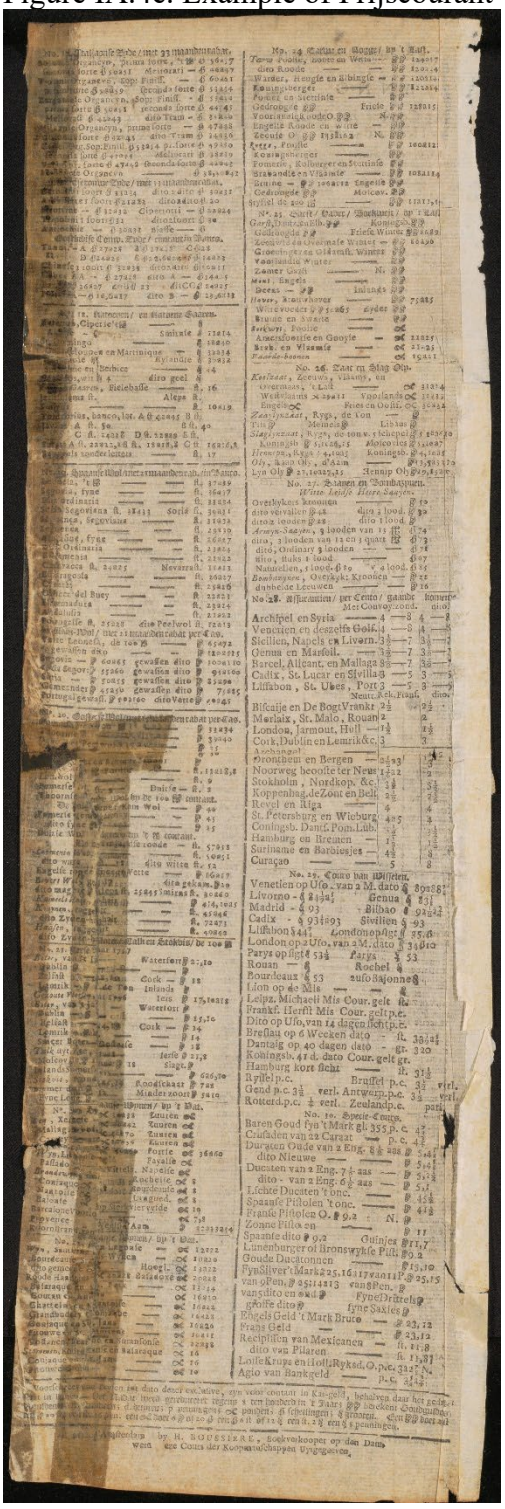
Source: Dutch National Archives, Archive of the Sociëteit van Suriname, 1650-1796 (1.05.03), 333.

Figure IA.4d. Example of notarial deed of protested bill



Source: City Archives Amsterdam, Collection of the Amsterdam Notaries 1578-1915 (5075), 12737.

Figure IA.4e. Example of Prijscourant



Source: International Institute of Social History (Amsterdam), NEHA Collection, Commercial and financial serial publications (472, ARCH03972).

C. Summary statistics

Table C.1: Voyage statistics: importing countries

	Number of voyages	%
Period 1764-1776	4,177	
NLD & UK & FRA	3,480	83.31
NLD	273	6.54
UK	2,475	59.25
FRA	732	17.52
Selected Caribbean colonies | NLD & UK & FRA	2,088	60.00
Destination unknown | NLD & UK & FRA	509	14.63

This table lists statistics on transatlantic slave voyages to Caribbean plantation colonies. The sample includes colonies with substantial plantation economies. Dutch: Suriname and Demerara-Essequibo. British: Barbados, Jamaica, and the Leeward Islands. French: French windward islands (Guadeloupe and Martinique jointly), and Saint-Domingue. The Danish West Indies are excluded because on average less than 3 slave ships arrived per year during our period. We also exclude the British Windward Islands, which were mostly newly developed after 1764 when the islands were ceded by the French. The period starts after 1763 when the Treaty of Paris ended the Seven Years' War, and the period ends in 1776 before the start of the Anglo-French War.

Table C.2: Colony statistics

	N	Mean	Sd.	p25	Med.	p75
Dutch	7	0.29				
British	7	0.43				
French	7	0.29				
Age in 1764	7	107.86	30.55	81.00	110.00	139.00
Sugar ratio	7	0.64	0.17	0.45	0.70	0.80
Log(Dist. Dutch)	7	13.10	9.78	3.87	13.45	23.39
N enslaved 1700-1750	7	151.92	108.41	82.79	147.38	187.28
N enslaved 1766-1776	7	243.23	214.95	19.09	254.58	291.92

This table shows colony summary statistics. The sample includes Carribean colonies with substantial plantation economies. Dutch: Suriname and Demerara-Essequibo. British: Barbados, Jamaica, and the Leeward Islands. French: French windward islands (Guadeloupe and Martinique jointly), and Saint-Domingue. The Danish West Indies are excluded because on average less than 3 slave ships arrived per year during our period. We also exclude the British Windward Islands, which were mostly newly developed after 1764 when the islands were ceded by the French. The period starts in 1763 when the Treaty of Paris ended the Seven Years' War, and the period ends in 1776 before the start of the Anglo-French War. *Age in 1764* is the number of years between colonization and 1764. *Sugar ratio* is the proportion of sugar in the total production of the colony. *Dist. Dutch* is the distance to the Dutch colonies. *N enslaved 1700-1750* is the number of imported enslaved during the first half of the 18th century (in '000). *N enslaved 1766-1776* is the number of imported enslaved during 1766-1776, our sample period (in '000).

Table C.3: Imports of enslaved people 1760-1771

	Number enslaved	%
Total	47,175	100.00
Middelburgse Commercie Compagnie (MCC)	6,347	13.45
Coopstad	7,764	16.46
MCC+Coopstad	14,111	29.91
MCC with transaction observations	5,301	
Coopstad with transaction observations	1,713	
Linked to plantations	2,971	

This table shows figures on our sample of transactions of enslaved people imported to Suriname during the period 1760-1771. We collect transaction level data from the archives of slave traders Middelburgse Commercie Compagnie and Coopstad & Rochussen.

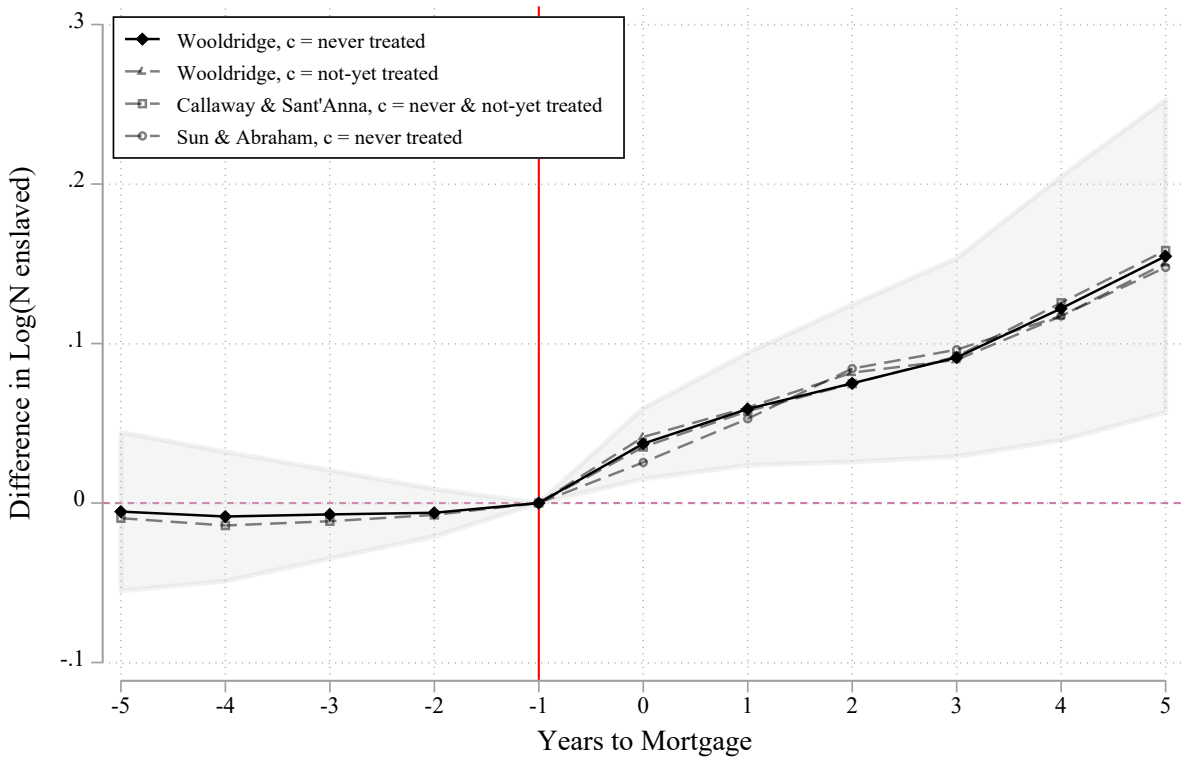
Table C.4: Voyage statistics: exporting regions

	Number of voyages	%
Period 1764-1776	4,177	
Dutch trade regions	1,335	31.96
Dutch | Dutch trade regions	169	12.89
British | Dutch trade regions	739	56.37
French | Dutch trade regions	403	30.74
Ports unknown | Dutch regions	484	36.92

This table lists statistics on transatlantic slave voyages. The regions on the African coast (as defined in Lovejoy et al. (2019)) where Dutch slave traders were active were the Forests (Windward), Loango and Voltaic coasts (Gold coast). The period starts in 1763 when the Treaty of Paris ended the Seven Years' War, and the period ends in 1776 before the start of the Anglo-French War.

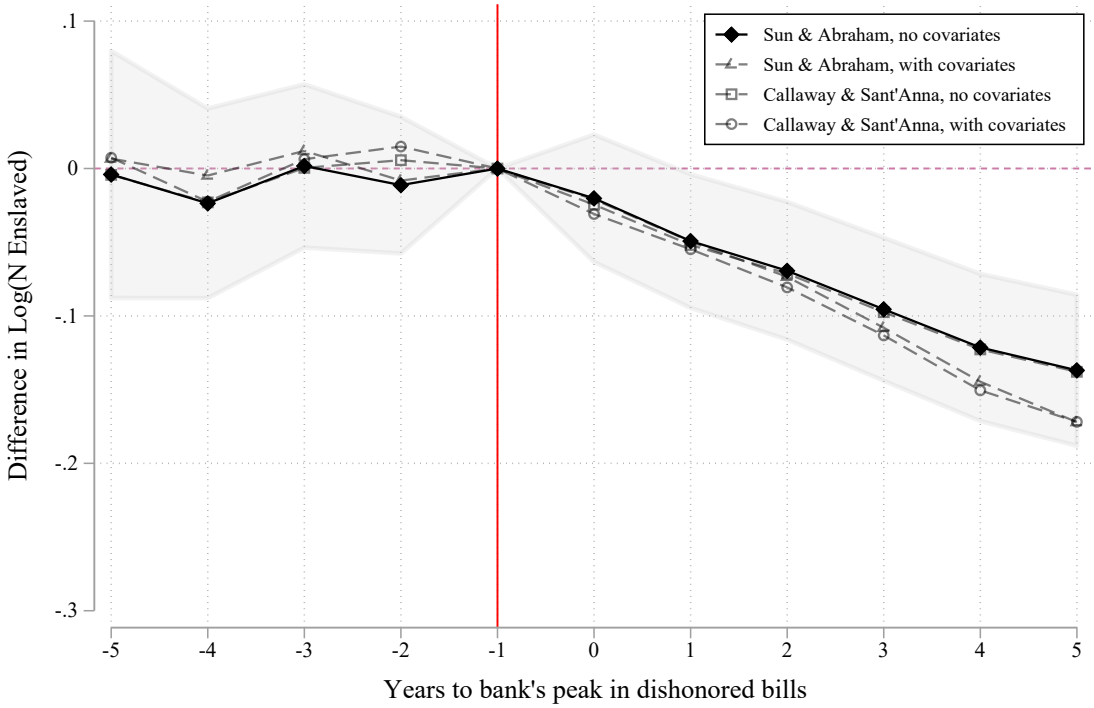
D. Alternative staggered diff-in-diff estimators

Figure D.1: Number of enslaved after plantation mortgage



This figure shows a dynamic diff-in-diff model showing the relation between plantation mortgage finance and the number of enslaved people on the plantation. The sample includes all plantation-year observations over the period 1760-1771. The figure shows estimates of various modified DiD approaches provided by Wooldridge (2021), Callaway and Sant'Anna (2021) and Sun and Abraham (2021). *T = 0* is the year of the plantation's first mortgage in the period 1760-1771. The figure shows 95% confidence intervals estimated by standard errors clustered at the plantation level.

Figure D.2: Credit tightening

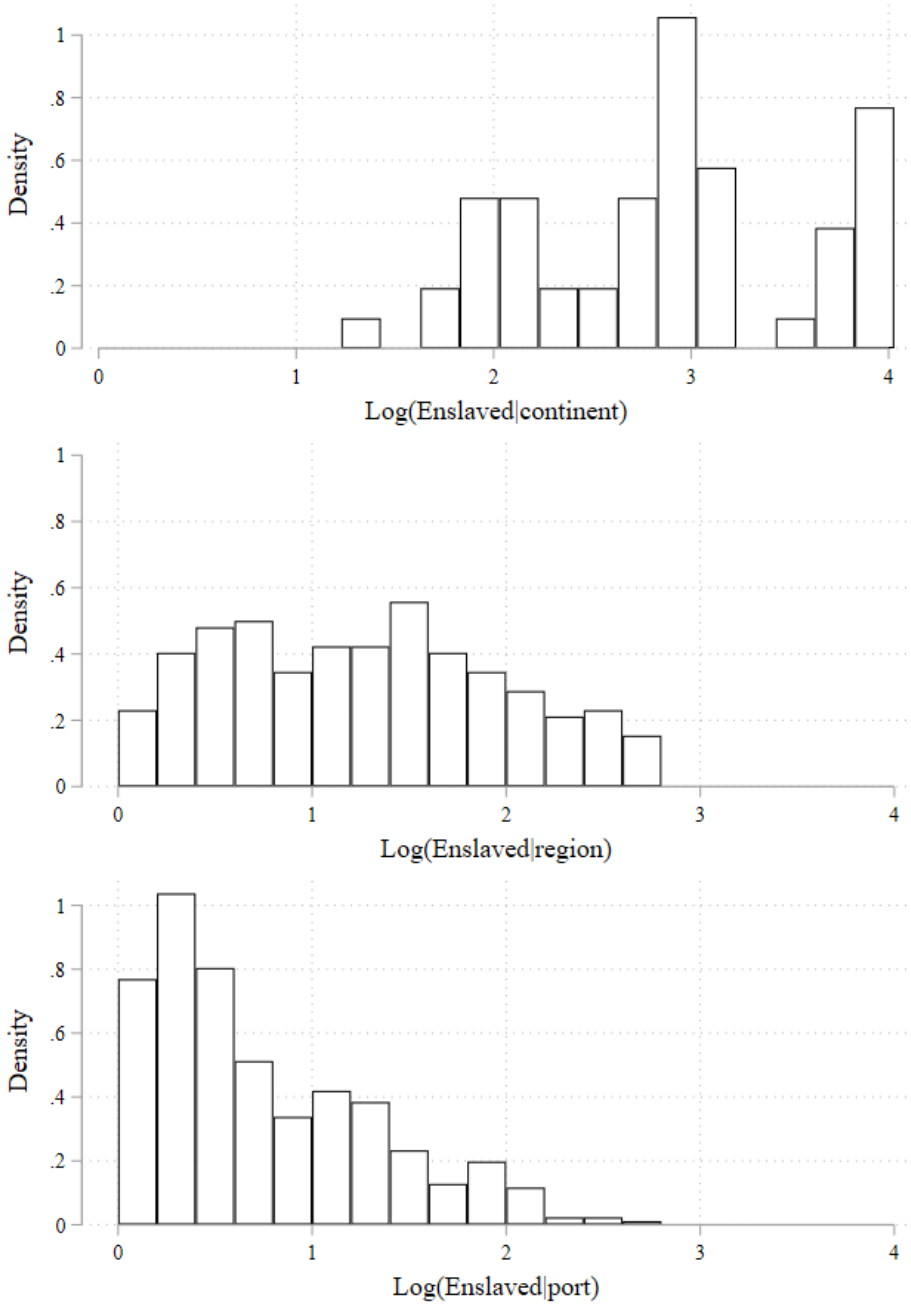


This figure illustrates numbers of enslaved people on plantations before and after their bank tightened plantation credit. We estimate a dynamic diff-in-diff model estimating the number of enslaved people on the plantation following a peak in the bank's dishonored bills of exchange from Suriname. The figure shows estimates of modified DiD approaches provided by Callaway and Sant'Anna (2021) and Sun and Abraham (2021), where $T = 0$ is the year of the bank's peak in dishonored bills of exchange. We either include or exclude interactions between covariates *Local* and *Planter experience* and year dummies. The shaded area illustrates the 95% confidence interval around the Sun & Abraham (2021), no covariates specification, with standard errors clustered at the plantation level.

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E. Log 1 + transformations

Figure E.1: Distributions of yearly imports of enslaved from different African locations



This figure illustrates the distributions of the dependent variables used in the crowding-out analyses where we added 1 before taking the natural log. The figure shows that this transformation does not lead to gaps or spikes in the distribution.

F. Aggregate estimates

Figure F.1 shows the distribution of the time between the departure of slave ships from the Dutch Republic and the sale of enslaved in Suriname. On average, this took around 12 months. This motivates the four-quarter lag of insurance premia when predicting the prices of enslaved in Suriname in Eqn. (5).

Figure F.2 shows quarterly imports of enslaved people to Suriname. The gray shaded region marks 1758q1–1760q2, the height of naval warfare during the Seven Years' War. The red dashed line plots a smoothed series obtained from a state-space model estimated with a Kalman filter, which decomposes observed imports into a persistent trend component and transitory noise. To avoid the war episode mechanically influencing the surrounding trend, we apply the filter separately within the pre-war, war, and post-war segments. Where two period connect, we use the average smooth estimate of both estimates.

Figure F.3, Panel A compares aggregate plantation-level estimates of slave imports with aggregate slave imports from the Slavevoyages database. The dark bars represent imports of existing plantations and the grey bars illustrate first year imports of newly established plantations (observed for the first time in our sample). Imports by existing plantations are estimated as the sum of all positive differences between the observed and expected number of enslaved on a plantation, where the latter is equal to the number of enslaved in the previous year, corrected for attrition:

$$\Delta S_t^P = \sum_{i \in P_t} \max\{0, (s_{i,t} - s_{i,t-1}(1-\delta))\} \tag{F.1}$$

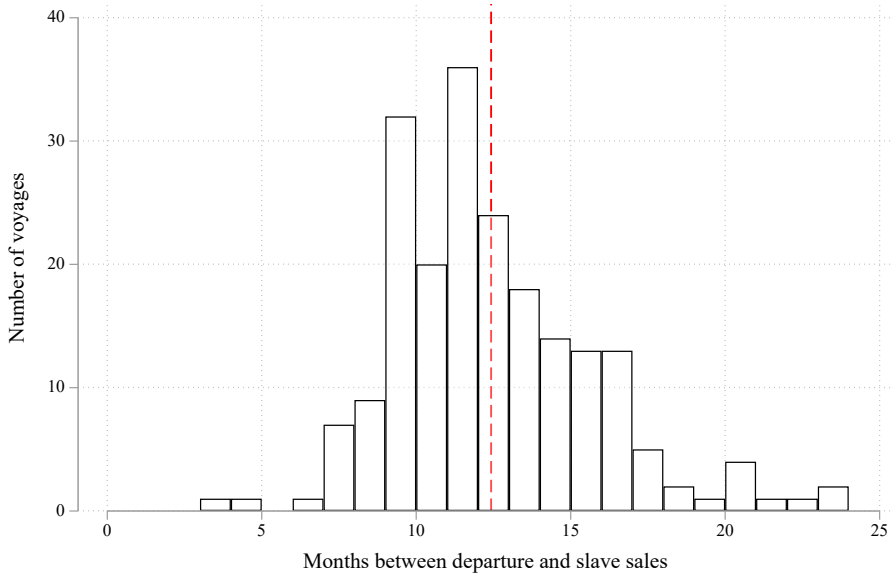
where P_t are all existing plantations in time t, $\delta = 0.027$ is the rate of attrition[32], and $s_{i,t}$ is the number of enslaved on plantation i in year t. For newly established plantations we take all enslaved in the first year as imports. The light bar in 1770 represents imports by newly established plantations that likely occurred before 1770.[33] The line shows aggregate slave imports from the Slavevoyages database, smoothed estimate using a Kalman filter. Panel B show corrected estimates (i) imputing the number of new plantations with the average annual number of new plantations over 1765-1769, and (ii) inflating the plantation-level estimates by $1/(1-\rho)$, where

[32] See Section V.D. for details.

[33] This is the first year with a complete overview of all plantations, likely reflecting some plantations that existed earlier but that we did not observe in our sample before.

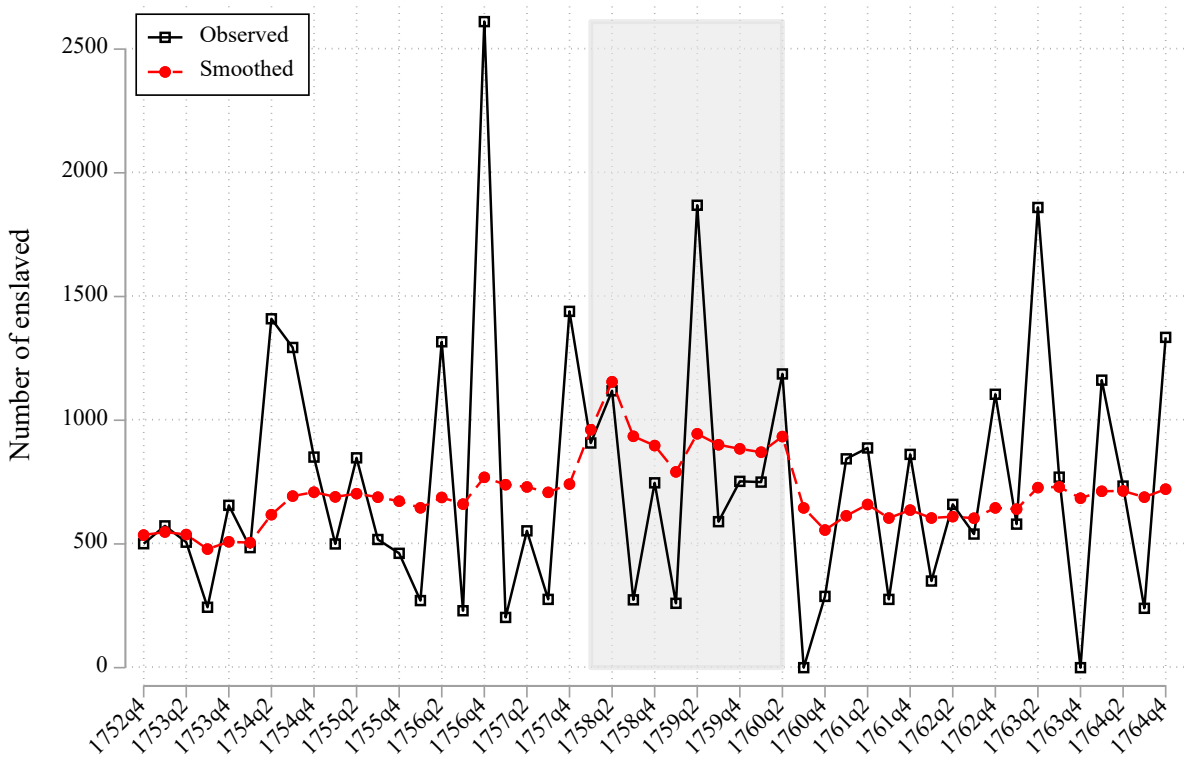
ρ is the fraction of plantations not covered in our sample. Picking $\rho = 0.25$ gives a close fit between the aggregate plantation-level estimates and the actual aggregate slave imports.

Figure F.1: Slave traders' sailing time between the Dutch Republic, West-Africa and Suriname



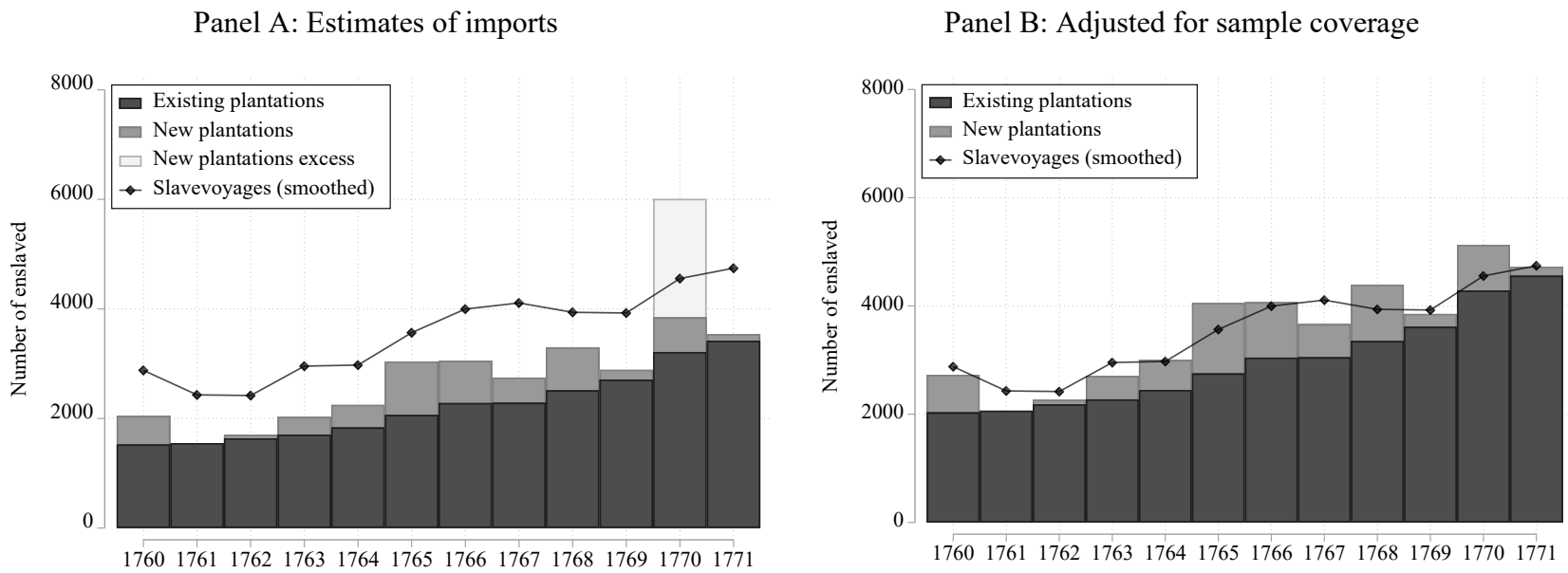
This figure illustrates the period between the departure of slave ships from the Dutch Republic and the sale of enslaved in Suriname. Data comes from the MCC.

Figure F.2: Observed imports and smoothed imports



This graph shows quarterly imports of enslaved people to Suriname. The gray shaded region marks 1758q1–1760q2, the height of naval warfare during the Seven Years' War. The red dashed line plots a smoothed series obtained from a state-space model estimated with a Kalman filter, which decomposes observed imports into a persistent trend component and transitory noise. To avoid the war episode mechanically influencing the surrounding trend, we apply the filter separately within the pre-war, war, and post-war segments. Where two period connect, we use the average smooth estimate of both estimates.

Figure F.3: Estimates of imports by existing and new plantations



Panel A compares aggregate plantation-level estimates of slave imports with aggregate slave imports from the Slavevoyages database. The dark bars represent imports of existing plantations; the grey bars illustrate first year imports of newly established plantations (observed for the first time in our sample). Imports by existing plantations are estimated as the sum of all positive differences between the observed and expected number of enslaved on a plantation, where the latter is equal to the number of enslaved in the previous year, corrected for attrition. For newly established plantations we take all enslaved in the first year as imports. The light bar in 1770 represents imports by newly established plantations that likely occurred before 1770. The line shows aggregate slave imports from the Slavevoyages database, smoothed estimate using a Kalman filter. Panel B show corrected estimates (i) imputing the number of new plantations with the average annual number of new plantations over 1765-1769, and (ii) inflating the plantation-level estimates by $1/(1-\rho)$, where ρ is the fraction of plantations not covered in our sample. Picking $\rho = 0.25$ gives a close fit between the aggregate plantation-level estimates and the actual aggregate slave imports.