Information Asymmetry in Mauritius Slave Auctions*

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September 22, 2006

Abstract

Evidence on adverse selection in slave markets remains inconclusive. A necessary prerequisite is that buyers and sellers have different information. We study informational asymmetry on the slave markets through notarial acts on public slave auctions in Mauritius between 1825 and 1835, involving 4,286 slaves. In addition to slave characteristics, the acts document the identities of buyers and sellers. We use this information to determine whether the buyer of a slave was related (e.g. a relative or a spouse) to the original slave owner, and thus most likely better–informed than other bidders. Auction–theoretic models predict that bidding should be more aggressive when informed bidders are present in open-bid, ascending auctions, such as slave auctions. By proxying informed bidders by related bidders, our results consistently indicate that this is the case, pointing toward the presence of information asymmetry in the market for slaves in Mauritius.

JEL Classification: D 82, N 37

Keywords: Information Asymmetry, Adverse Selection, English Auctions, Slavery, Mauritius.

*Vencatachellum acknowledges financial support from the FQRSC and the Fonds Mercure of HEC Montreal. Funding from the Canada Research Chair in Risk Management and the CIRPÉE is also acknowledged. We are indebted to Shirley Chenny for outstanding research assistance. We thank the staff at the Mauritius Archives for their help in locating the notarial acts and Benoit Aboumrad for his help in collating information. We have benefitted from very helpful comments from and discussions with Moez Bennouri, Jean–Marc Bourgeon, Liam Brunt, C. Robert Clark, Benoît Dostie, Ángel Hernando–Veciana, Rafael Lalive D'Epinay, Dezsö Szalay, and Simon Van Norden.

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1 Introduction

1.1 Issues and motivation

According to Akerlof (1970), four necessary conditions are needed for adverse selection. First, and foremost, one party to the sale should be more informed than the other. Second, the quality of the product or service being sold should be valuable to both parties. Third, price should not be set by the more informed party. Finally, uncertainty should not be completely dissipated by extra-trading arrangements, such as warranties or litigation practices.

This paper looks at the first of these four prerequisites in the particular context of slave markets. More specifically, we ask whether or not informational asymmetries between buyers and sellers might have been present in Mauritian slave auctions of the early Nineteenth century. Clearly, as the null hypothesis of no informational asymmetry is tantamount to a null of no adverse selection, this paper is also indirectly concerned with the latter.

At first glance, the market for slaves would certainly appear to satisfy the necessary Akerlof conditions for adverse selection. First, buying a slave remained a risky investment in which the buyer was likely at an informational disadvantage compared to the seller (Fede, 1987; Wahl, 1996). A slave-owner would undoubtedly have had more time to assess the productive abilities of a given slave.[1] Second, with the exception of slaves bought for manumission, the vast majority of slaves that were sold went from one productive activity

[1] Although professional slave traders might not have had this informational advantage, the usually long periods between taking charge of a slave and final sale would have given them time to assess temperament, propensity to flee, resistance to illness, ... For example, Freudenberger and Pritchett (1991) estimate a modal duration of two to three months for interstate trade toward the New Orleans market.

to another. Unless involving an important change of type of work (e.g. from field hand to skilled work), sellers and buyers would presumably value the same characteristics. Third, slaves were usually sold in competitive markets (Freudenberger and Pritchett, 1991), thereby limiting the scope for market manipulation by informed sellers. Finally, although much more complex than commercial law, the law governing slave sales was generally unable to eliminate the negative effects of information asymmetry completely (Wahl, 1996).

Nonetheless, although adverse selection is likely to have been present in slave markets, the empirical evidence concerning its incidence remains inconclusive. On the one hand, Greenwald and Glasspiegel (1983) contend that adverse selection, and consequently information asymmetry, were empirically important. Studying the New Orleans market for local and imported slaves they rely on the origin of the slave as an observable seller characteristic to gauge the degree of adverse selection. Greenwald and Glasspiegel (1983) conjecture that owners from low-productivity areas (e.g. Old South, or Border States) would have had a higher marginal propensity to sell and therefore no interest in keeping only the best slaves and selling the low-quality ones. In comparison, owners from high-productivity Louisiana would cull bad slaves for resale purposes. Consequently, prices for imported slaves in the New Orleans market would be higher than for local slaves. Their empirical results, as well as those of Choo and Eid (2004), confirm this intuition.

However, Pritchett and Chamberlain (1993) criticize the conjecture that higher prices for imported slaves reflected adverse selection. First, they argue that one setting in which adverse selection ought to be minimized was that of estate sales where assets (including slaves) were liquidated following the death of the owner. In comparison, voluntary sales should be more subject to the practice of culling bad slaves and therefore exhibit lower prices. Yet, they find no statistically significant difference between prices observed during estate and voluntary sales. Instead, Pritchett and Chamberlain (1993) suggest an alternative explanation for the difference in the prices of imported versus local slaves. If a fixed transportation cost is applied to an imported slave, irrespective of the slave's quality and if prices are positively related to quality, then clearly the relative prices of high-quality slaves will decrease with respect to those of inferior ones. Slave buyers would therefore have responded to this fall in the relative price of high-quality slaves by demanding more of them (Pritchett and Freudenberger, 1992; Pritchett and Chamberlain, 1993). The higher prices fetched by imported slaves on the New Orleans market simply reflected the fact that they were of higher quality compared to local slaves and did not result from an adverse-selection discount applied against local sellers.

Hence, the debate on the presence of adverse selection on slave markets remains unresolved. Whether or not adverse selection in general, and informational asymmetry in particular, were indeed present does matter to the extent that *not* taking it into account may bias evaluations of the profitability of slavery. Under perfect markets, the price of any productive asset should reflect the expected discounted value of future dividends. In the context of slavery, these dividends are simply the value marginal product of the slave net of costs. Under informational asymmetry, this valuation breaks down, and prices no longer reflect fundamentals. It then becomes hazardous to infer the productive capacity of the general slave population from the market prices of slaves who might actually be inferior ones culled by their owners (e.g. Greenwald and Glasspiegel, 1983; Choo and Eid, 2004, among others). Since profitability is at the root of the viability of the slavery institution (Fogel, 1989; Fogel and Engerman, 1974), a further look at this issue is certainly warranted.

This paper proposes to address the issue of adverse selection from the different perspective of its necessary prerequisite of information asymmetry. If information is symmetric, then clearly the conditions necessary for adverse selection are not met. Buyers and sellers share a common information set and competitive markets will ensure that prices correctly reflect the fundamentals of slave ownership. If information is asymmetric, then adverse selection is possible, but not proven.

We depart from previous analysis in at least three important ways. First, we focus on a slave market which has received comparatively less attention: that of early nineteenth century Mauritius. Second, we analyze adverse selection from the different perspective of information asymmetry, drawing on an auction-theoretic background. Finally, we resort to a rigorous estimation and inference framework to gauge the importance of informational asymmetry.

1.2 Methodology and results overview

Although Mauritius remained an important slave colony of the French, and, beginning in 1810, of the British, until slavery was finally abolished in 1835, Mauritian slavery has not been as extensively studied as its American counterparts.[2] Despite distance, Chenny et al. (2003) show that Mauritian slavery displayed remarkable parallels with its better-known counterparts elsewhere. Valuation of physical strength, skills and reproductive capacities

[2] It is estimated that 85% of its population of 78,000 were slaves in 1807. See Burroughs (1976), Benedict (1980), Nwulia (1981) Barker (1996), Teelock (1998), Scarr (1998), Valentine (2000) and Allen (1999, 2001) for historical and sociological discussions and bibliographies on Mauritian slavery in particular. See Clarence-Smith (1989), and Scarr (1998) for discussions of the Indian Ocean slave trade in general.

were just as prevalent as those found in the Americas (Mancall et al., 2001; Bergad et al., 1995; Newland and San Segundo, 1996; Kotlikoff, 1979, 1992, among others). On the other hand, compared to the New Orleans market, the Mauritian slave market can safely be regarded as purely local. On this small island of 720 square miles, slave imports were effectively banned by the British. The implications are that variations in the prices paid for slaves could not be attributed to differences in quality induced by transportation costs, thereby addressing the critique by Pritchett and Chamberlain (1993).

In order to study the Mauritian slave market, we augment and complement the database introduced by Chenny et al. (2003). This database initially consisted of detailed notarial acts on auction sales of slaves over the period 1825-1827. In Section 2, we extend the period covered to include the years up to 1835, for a total of 580 auctions involving over 4,200 slaves in the primal data base. Our database includes detailed information on slaves' characteristics (ethnicity, gender, age, skills, bundle composition). Importantly, for a subset of slaves sales, it also contains transactional data on the motivation for the sale, as well as on the identities of the seller and buyer. This allows us to differentiate between voluntary and involuntary (i.e. succession, bankruptcy) sales. Moreover, a careful analysis of the notarial acts allows us to gauge the degree of parental relationship between the seller and buyer. This variable is a key ingredient of our empirical evaluation of information asymmetry.

Heuristically, it may be argued that a close parental (or business) relationship with the owner could lead to more and better information on the slave's characteristics. Furthermore, if we take into account the fact that the Mauritian market was local and that auctions were publicized well in advance, it appears reasonable to suppose that these seller-bidder ties would have been public information. Observing that a relative or partner of the original owner was bidding for a slave at the auction could signal to the market that this particular slave was of high quality. Clearly, a related bidder could also try to acquire the slaves for other, more personal reasons that are unrelated to a slave's productive characteristics (e.g., personal attachment, manumission purposes, …). In the former case, competitive bidding would probably have been more aggressive, in the latter, it should not have been affected by the related bidder's participation. Put differently, any informational asymmetry regarding a slave characteristic valued by all bidders (common value) should have been reflected in a slave's price; information asymmetry related to a slave characteristic valued only by a particular bidder (private value) should not.

To substantiate this claim and to construct our empirical test, we use the interdependence of bidding behavior in public auctions where information is asymmetric and where the good being auctioned has both a common and a private value. In this setup, the behavior of better-informed bidders will affect that of others who infer the quality of the good from the actions of the formers. The auctions literature has long recognized that this environment is well suited for the analysis of informational asymmetry (e.g. Milgrom, 2004; Maskin, 2004, among others).

We resort to a well-known theoretical model of English auctions in Section 3.1. The framework, developed by Wilson (1998) and later extended by Hong and Shum (2003), considers open-bid ascending auctions characterized by informational asymmetries among bidders and by private and common valuation and it is particularly appropriate for the analysis of slave markets. Importantly, the Wilson (1998) model derives closed-form solutions for the Bayesian-Nash equilibrium bids under log-normal distributions for values and signals. We can extend this model to our particular setting by characterizing an informed (related) bidder as one with a perfect signal on the slave's common value but who nonetheless also values the slave for personal motives. In the Wilson (1998) model, individual signals and valuations are not observed, but distributional assumptions governing these signals and valuations are considered public information. This means that the identity of the informed bidder would be known, as was likely the case in our setting.

Although analytical expressions for the equilibrium bidding strategies are derived, the exact role of the informed-bidder assumption is difficult to extract. We therefore resort to numerical analysis in Section 3.2. Using Monte-Carlo experiments, we compute the ex-post distribution of equilibrium bids while taking into account parametric uncertainty. Our results indicate two clear and intuitively-appealing outcomes. First, the presence of the informed bidder systematically leads to more aggressive bidding (Result 1). When the informed bidder exits the auction, the market interprets this as a bad signal on the auctioned good's common value and bids fall accordingly, until this effect is eventually subsumed by the additional information revealed in subsequent bidding rounds. As we increase the uncertainty surrounding the weight of personal motives in the informed bidder's total valuation, the bid premium is reduced but still remains positive. Hence the auction-theoretical model result reveals that bids (and consequently) prices should be higher when an informed bidder is present. Secondly, the informed bidder ends up paying a higher equilibrium price in those instances where he does win the auction (Result 2).

In the empirical analysis of Section 4, we attribute more information to personal seller-bidder ties and associate an informed bidder with a related bidder. Our data set does not contain information on *all* instances where related bidders participated in slave auctions.

However, we observe cases where related bidders *made the winning bid* and subsequently recorded the sale with the notary. It is thus unlikely that these sales were motivated by market manipulation on the part of those entitled to the proceeds of the auction. Hence, testing Result 2 is tantamount to testing whether slave prices were effectively higher when a related buyer ended up buying the slave.

Consequently, we specify an hedonic pricing econometric model of log prices, using slave characteristics (ethnicity, age, skills, the presence of children in bundle and gender) as well as seasonal and time dummies as control variables. We augment the specification with a binary variable indicating whether or not the buyer is related to the original owner. We interpret a positive premium on this variable as indicating the presence of informational asymmetries.

The estimated parameters presented in Section 4.2 all have the desired signs: prices are higher for ethnic groups considered more productive, are bell-shaped in age, increase with skills and the presence of children and in peak sugar cane production seasons and years. Our theoretical prediction in Result 2 is confirmed whether or not we control for potential endogeneity in the related-buyer variable or for the fact that it is a discrete variable: the premium on the related buyer is positive, indicating that the null hypothesis of symmetric information is rejected. Various additional robustness checks only confirm this result.

As mentioned earlier, the presence of information asymmetry can be considered as *prima facie*, although inconclusive evidence for adverse selection. We consequently compare voluntary and involuntary sale prices in the spirit of Pritchett and Chamberlain (1993). We find that prime-aged male field hand slaves fetched a 45% premium when sold in succession, as opposed to voluntary sales. We might therefore be tempted in concluding that adverse selection is indeed present in the Mauritian slave market. However, a careful analysis of samples also reveals a fundamental difference between the two markets: related buyers are absent from voluntary sales and active in involuntary sales. As our theoretical and empirical results show, their sole presence is sufficient to induce more agressive bidding. Consequently, the higher prices in involuntary sales likely reflects *self*-selection, and not necessarily adverse selection.

2 Data

The information on the sale of Mauritian slaves is obtained from the notarial acts in the General Inventory of Notaries (group NA) filed in the Mauritius Archives located in Coromandel, Mauritius. Under Mauritian colonial law, notaries played a key role in the public auctions of slaves (Government of Mauritius, 1824, Proclamation of July 16, pp 122-125). In particular, notaries certified the ownership titles of the sellers, recorded the list of slave characteristics, as well as the motivation for the sale. They subsequently publicized and organized the public auction. These auctions took place as oral (open) ascending bids, following a slave inspection period.

Following the auction, the notaries recorded transactional information between the seller and the buyer of the slave, including the slave's price and observable characteristics as well as the name of the buyer. In what follows, we focus exclusively on sales conducted through public auctions and abstract from private person-to-person sales for which we have no recorded information.

We build on the database first introduced by Chenny et al. (2003) who used the notarial acts for 1825 to 1827. They considered a sample of 152 auctions involving the sale of close to 1,300 slaves. We extend the period covered up to January 1835, for a total of 580 auctions involving 4,286 slaves in our primary data set. Even though other auctions were also held over that period, slaves were actually sold only during those auctions in our sample. These sales were recorded in the notarial acts of fifteen notaries described in Table 1. Most were operating from the capital, Port-Louis. One notary, Alexandre Bonnefin, accounts for 26% of all auctions and 20% of all slaves sold during the whole period. Three notaries were active up to 1829 and we found no record of sales which they would have performed afterwards.

The notarial acts contained limited information on the slave buyer's and seller's characteristics, and no information on the actual bidding process (e.g. number, identities and occupations of participants, number of bids, ...). However, the acts contain detailed information on slaves being auctioned. Hence, the slave's gender was recorded either explicitly or implicitly.[3] Moreover, a slave's age and ethnicity were also reported. Following contemporaneous descriptions, slaves' ethnic groups were classified as Creoles (born on the island), Malagasy, Mozambiques and Indians (including Malays). Table 2 verifies our sample's representativeness of the slave population in Mauritius by comparing it with the 1826 partial census data from the *Greffe de l'Enregistrement des Esclaves* in the Mauritius Archives (Teelock, 1998; Valentine, 2000). Overall, gender, ethnicity, as well as age distributions by ethnic group in our sample are quite close to those obtained from the

[3]For example, the acts written in French distinguish between *vendu* (male) and *vendue* (female).

census. We therefore conclude that our sample is reasonably representative of the general slave population.

We use the Telfair (1830)'s occupational classification to characterize a slave's work. We aggregate slave occupations into three categories: laborers, agriculture and sea-related; household slaves; and skilled slaves (see the notes to Table 3 for a more complete description). Table 3 reports the average prices across gender, occupation and ethnic group. Our main findings may be summarized as follows: (i) female slaves consistently fetched lower prices; (ii) price differences across ethnic groups are significant, with Creoles fetching the highest prices; and (iii) premiums are associated with skilled occupations. These findings are consistent with those of Chenny et al. (2003) for the 1825-1827 period.

Slaves on the secondary market were either sold voluntarily by their masters or sold involuntarily following their owner's bankruptcy or death (succession sales). Under the French Civil Code (adapted for Mauritius under Code Decaen, 1804), following a bankruptcy, all the assets (including slaves) of the individual or company had to be liquidated through an auction. Succession laws (also specified in the Civil Code) prescribed that the succession should be divided among heirs following the death of the owner(s). Complete liquidation of assets through an auction was automatic whenever a heir was minor, absent or legally ineligible. Similarly, auction sales would have been organized whenever heirs failed to reach an agreement concerning the valuation and distribution of the assets among themselves. In this case, the value of the proceeds from the auction would have been divided among the heirs.

When the reason for the auction could not be obtained from the notarial acts, either because it was not documented or the reason was illegible because of the deteriorated condition of some documents, the motivation for the sale was classified as unknown. In Table 4, the vast majority (77%) of auctions took place to liquidate the estate of a deceased person, while only 9% were because a slave owner voluntarily wanted to sell his or her slaves. The remaining auctions occurred because of bankruptcy.

Finally, each notarial act gives the name of the person who initiated the sale, the name of the original owner and the name(s) of the buyer(s). In the case of succession sales, each notarial act also lists the name of all the heirs, as well as any other individual who is entitled to some part of the proceeds of the sale.[4] This allow us to determine whether or not buyers and sellers are related or not. We formally define related parties as follows:

Definition 1 *A buyer is said to be related to a seller whenever family or business ties link the two parties.*

To better understand how we proceeded to classify sales between related and unrelated, an example might be useful. On July 2^{nd} 1826, notary Dubor (NA 63) auctioned the estate of deceased sieur Deville, a police commissioner (*Commissaire civil et de police*) in the town of Pamplemousses located in the north of Mauritius. Sylvain Chauveau, the testament executor, is recorded as the seller. The estate consisted of 12 slaves: 2 mothers with their children (1 and 3 in each case), 2 skilled males (cook and carpenter), 2 female laundresses, 1 female seamstress and 1 female domestic worker. All the slaves, except the cook Caramouche and the female domestic worker Zaize, were purchased by the wife of the deceased sieur Deville. The widow is obviously related to the original slave owner. Caramouche was purchased by Hypolite Dupery for whom we could not find any link

[4]This would be the case for example if there were any creditor.

with either sieur Deville or anyone else mentioned in the notarial act. As for Zaize, she was purchased by G. Deville. Although the latter has the same last name as the deceased, (s)he is not mentioned anywhere in the notarial archive as being related to the deceased slave owner. We code such a sale as the buyer and seller having the same names and being possibly related.[5]

We repeated the above procedure for each slave. Given that mothers were sold together with their younger children under *Code Noir* and that we exclude voluntary bundling of adult slaves, we are left with a usable sub-sample of 3,307 sales. The distribution of the potential link between the buyer and seller is reported in Table 5. We find a link between buyers and sellers for 1,003 slaves (3,307-2,304). In the case of succession sales, conditional on being related to the deceased, the widow(er) is the modal buyer. The second group of related buyers is composed of the former owner's children. The share of related buyers is lower in the case of bankruptcies (4.6%) or voluntary sales (12.6%) than in succession sales (38.5%). In the case of voluntary sales, the modal related buyer is the original owner himself (14 purchases).[6] This highlights a fundamental difference between voluntary and involuntary sales in our sample. Related buyers (other than original owner) were active in involuntary sales and almost completely absent from voluntary sales. Unrelated buyers were active in both.

[5]For robustness reasons, we also assumed that individuals with the same last name were unrelated, without any qualitative change in our results.

[6]Note that, as was the case in New Orleans (Freudenberger and Pritchett, 1991), the original owner could buy back his own slaves. These owners may have decided to buy back the slave given that the proposed bid was less than their reservation value, or, more likely, in order to cancel prior sales and return purchase price to the buyer.

3 Theoretical analysis

This section first characterizes an auction model applicable for the analysis of slave markets. We then describe the theoretical predictions of one such model yielding closed-form equilibrium bids.

3.1 A relevant auction model for Mauritian slave auctions

The main elements characterizing Mauritian slave auctions can be summarized as follows:

1. Slave auctions are public, with oral ascending bids.

2. Valuation of the slave might involve personal (e.g. love, affection, ...) as well as purely productivity-related motives.

3. Information is unlikely to be symmetric across buyers and sellers, and across bidders.

One setting which is particularly well-suited for our analysis is the open-bid, single-good, ascending English auction model, with private and common value and informational asymmetry across bidders. Allowing for both private (i.e. personal) and common (i.e. productivity) value is particularly useful in that bidders can learn something about the quality of the good during the bidding process that can change their reservation prices (Milgrom, 2004; Maskin, 2004). It is natural to believe that oral English auctions may introduce such interdependence in individual values.[7]

[7] In the presence of interdependent or common values, the analysis of efficiency is more complicated. However, Maskin (1992) and Krishna (2003) show that an equilibrium, with one-dimensional signals, can still be efficient in ascending auctions with interdependent values and asymmetric bidders (different value functions) if interpersonal crossing conditions hold. When signals are multidimensional, efficiency is no longer possible (for a general proof of inefficiency see Jehiel and Moldovanu (2001)).

One important contribution for empirical studies on auctions with private and common components is that of Wilson (1998). Like many authors in this literature (Milgrom and Weber, 1982; Krishna, 2003, among others), Wilson (1998) considers a specific case of English auctions labeled as the button (or Japanese) auction in which the dropping-out decision is both public and irrevocable. Under the joint assumption of log normal, multiplicative values and information asymmetries, the equilibrium strategies are log-linear and can be computed as a function of the chosen parameters.[8]

Specifically, agents denoted $i = 1, \ldots, N$ are characterized by a valuation (common and private) V_i and a signal (valuation plus noise) X_i concerning an object sold at an ascending, open-bid auction. Each round of the auction consists in agents submitting bids, with the lowest bid being dropped out and a new round being started. At each round k, agents can observe the signal of the exiting bidder, but need to infer that of the $N - k$ other bidders who remain active. Given price P, the equilibrium bidding strategy of agent i at bid round k, β_i^k, must satisfy:

$$P = \mathrm{E}[V_i \mid X_1 = (\beta_1^k)^{-1}(P), \ldots, X_{N-k} = (\beta_{N-k}^k)^{-1}(P), X_{N-k+1}, \ldots, X_N], \qquad (1)$$

for $i = 1, \ldots, N-k$. Under general monotonicity conditions, it can be shown that such an equilibrium exists and is obtained by solving (1) for the $N - k$ inverse bidding functions $(\beta_{N-k}^k)^{-1}(P)$ (Hong and Shum, 2003, Proposition 1, p. 331).

Importantly, it is possible to derive closed-form expressions for the Bayesian-Nash equilibrium bidding functions when the stochastic process is log-normal. In particular,

[8]Krishna (2003) shows that the Wilson model generates efficient sequential equilibria, even in asymmetric auctions. Hong and Shum (2003) extend the Wilson model by relaxing the perfectly diffuse prior assumption for the common value.

assume that (log) valuation $v_i \equiv \log(V_i)$ and (log) signal $x_i \equiv \log(X_i)$ are distributed as follows:

$$v_i = a_i + v \tag{2}$$

$$a_i = \bar{a}_i + \epsilon_{a_i}, \quad \epsilon_{a_i} \sim N.I.D.(0, t_i^2) \tag{3}$$

$$v = m + \epsilon_v, \quad \epsilon_v \sim N.I.D.(0, r_0^2) \tag{4}$$

$$x_i = v_i + \epsilon_{x_i}, \quad \epsilon_{x_i} \sim N.I.D.(0, s_i^2). \tag{5}$$

The valuation for each agent v_i is the sum of an idiosyncratic private value a_i and a common value v; t_i is the standard error of the private value and r_0 that of the common value. The idiosyncratic signal x_i is given by the individual value plus an idiosyncratic noise term ϵ_{x_i} with standard error s_i varying across agents.

Under the assumption of log-normality, the equilibrium bid of agent i at round k satisfies:

$$b_i^k \equiv \log(\beta_i^k) = 1/A_i^k(x_i + D_i^k x_d^k + C_i^k), \tag{6}$$

where x_d^k is the ex-post observable vector of signals from exited bidders and where A_i^k, D_i^k, C_i^k are functions of the distributional parameters $\bar{a}_i, t_i, m, r_0, s_i$ (Hong and Shum, 2003, eq. (12), p. 334).[9]

[9]For completeness, we reproduce the closed-form expressions for A_i^k, D_i^k, C_i^k in the Appendix A.1. The main difference between Wilson (1998) and Hong and Shum (2003) is that the former assumes a perfectly diffuse prior on the common value corresponding to $r_0 = \infty$, whereas the latter do not.

This model is well-suited to analyzing the impact of the presence of an informed bidder on equilibrium bids. In particular, we can rewrite the signal function (5) as:

$$x_i = (\bar{a}_i + \epsilon_{a_i}) + (v + s_i\xi_i), \quad \xi_i \sim N.I.D.(0,1). \tag{7}$$

Hence, the signal is the sum of a noisy private component $(\bar{a}_i + \epsilon_{a_i})$ and a noisy estimate of the common value $(v + s_i\xi_i)$. In this light, an informed bidder, $i = I$, could be thought of as one whose signal on the common value is precise compared to others:[10]

$$s_i = \begin{cases} 0, & \text{if } i = I, \\ > 0 & \text{otherwise.} \end{cases} \tag{8}$$

The signal on the common value to an informed bidder is thus the common value itself. The overall signal x_I in (7) however remains noisy since it incorporates a noisy private signal as well. An analytical evaluation of the effect of restriction (8) is complicated by the nonlinearities in the distributional parameters found in A_i^k, D_i^k, C_i^k. Alternatively, we may resort to numerical approaches to which we now turn.

3.2 A Monte-Carlo Experiment

We conduct a Monte-Carlo experiment to analyze the impact of the informed bidder restriction (8) on the equilibrium bids (6) (see Appendix A.2 for details). To ensure independence to parametric choices, we stochastically generate all the model's distributional

[10]Recall that because the distributional parameters $\bar{a}_i, t_i, m, r_0, s_i$ are known, this implies that the identity of the informed bidder is also known by other bidders

parameters at each replication and verify and confirm robustness to the other remaining ones (see Appendix A.3).

Specifically, for agent $i = 1, \ldots, N$ active in bidding round $k = 1, \ldots, N$ of Monte Carlo experiment replication $j = 1, \ldots T$, we define $\hat{\pi}(i,k) \equiv \text{Median}(\pi(i,k,:))$ as the median of the difference between all agents' bids with $b^1(i,k,j)$ and without $b^0(i,k,j)$ informed bidder:

$$\pi(i,k,j) \equiv b^1(i,k,j) - b^0(i,k,j), \quad \forall i,k = 1,\ldots N \tag{9}$$

Figure 1 plots the median premium $\hat{\pi}(i,k)$ against the bidding round number k. The identities i for some bidders are indicated.[11] Moreover, we identify the median retirement bid for the informed bidder which was evaluated at round 18 out of $N = 30$. We observe that, *for all* agents, the median informed bidder premium is positive until the informed bidder retires from the bidding process. Specifically,

Result 1 *All bids are higher when the informed bidder is actively participating in the auction.*

For those high-value bidders remaining after I has left, the premium is negative and becomes negligible as we approach the end of the process; for median- and low-value bidders, the premium is positive until they retire. Furthermore, the premium for the highest bidders are similar in shape and decline in the intensity of the bids. In addition, for median- and low-value bidders, the premium increases until they retire. Finally, the

[11] Recall that bids are re-sorted at each round in descending order. The bidder's identity should be interpreted as his position in the sorted bids. Hence, for example, bidder $i = 17$ at round $k = 5$ is the 17^{th} highest bid of the remaining $N - k = 25$ bidders.

premium is largest for the lowest bidders who retire early on in the bidding process (located to the left of the graph).

These results are intuitively appealing. The fact that the informed bidder remains active is interpreted as a good signal on the common value. Consequently, *all* the participants bid more aggressively than if he had not been present. However, when the informed bidder exits, high-value bidders interpret this negatively and the bid is lower than it would have been otherwise. Eventually, the information from the informed bidder's decision is subsumed by the new information as other bidders exit and the two bids become identical. The fact that the informed bidder premium is highest for low-value-signal bidders is also intuitive. Since valuation is the sum of a common and private value term, a low value, on average, corresponds to a low private value. Since these agents comparatively value the common component more, any information revealed by the informed bidder's action is very valuable. The longer the informed agent remains in the bidding process, the greater the confirmation that the common value might be high.

The more aggressive bidding when the informed bidder I remains active comes about from the interaction of the winner's curse and loser's curse (see also Hernando-Veciana and Tröge, 2004, on this). The fact that I remains active could be because of a high common value. Then, an uninformed bidder retiring from the auction incurs a loser's curse ("the informed bidder knows that the common value is larger than what the uninformed bidder thought"). However, I could remain active because of a high private value; remaining active therefore implies the risk of a winner's curse ("the informed bidder knows that the common value is less than what the uninformed bidder thought"). Our results indicate that for a wide range of parametric specifications, the loser's curse effect is higher, such that bidders are willing to bid more aggressively knowing that the informed bidder remains active.

A corollary of this observation is that, if I remains active until the end, then the $(N-1)^{th}$ bidder will also bid more aggressively and I will end up paying a higher price. To verify this claim, we therefore compute the informed bidder premium conditional on I winning the auction, i.e. $\pi(i = I, k = N, j)$.[12] This corresponds to the difference in price the informed bidder would have to pay given that he ended up winning the auction. Figure 3 plots the distribution of premia. It clearly indicates that the premium is, on average, positive, with a median of 0.0984. This allows us to conclude that:

Result 2 *The winning bid is higher when the informed bidder wins the auction.*

In the subsequent econometric analysis, we formally test Result 2 using our Mauritian slave auctions data discussed in Section 2.

4 Empirical analysis

4.1 Methodology

We saw earlier that our data set allowed us to gauge the degree of relation between slave sellers and buyers. Moreover, we showed that the presence of better-informed bidders in public auctions resulted in more aggressive bidding from all bidders (Result 1) and a higher price being paid by the better-informed bidder in those instances where he wins the auction (Result 2). We now regroup these two to obtain a testable restriction by making the following two assumptions:

[12] In our Monte-Carlo experiment, the informed bidder won the auction 395 times out of 5,000 replications.

Assumption 1 *Compared to other bidders, a related bidder has superior information on the unobservable characteristic(s) of a slave correlated with the slave's common value.*

and

Assumption 2 *A related bidder's identity is known by other bidders.*

The first assumption appears realistic. We saw in Table 5 that the vast majority of related buyers were either the spouse or children of the deceased owner in succession sales. It would seem natural to suppose that these bidders would have had sufficient time to acquire privileged information on the slave being auctioned.

The second assumption is also reasonable. The small size of the Mauritian market, both in its limited number of participants and geographical concentration would make it likely that bidders would have known each other. It is of course entirely possible that a related bidder would have preferred to hide the informational content of his bidding strategy by hiring an agent in order to conceal his identity. Again, we do not have access to the actual bids, only to the winning bid so that we cannot verify the actual impact of this. Nonetheless, three elements lead us to argue that it probably wouldn't have affected our results much. First, from an econometric standpoint, the implications are that our "unrelated" variable would have been measured with error (since some related winners would have been wrongly classified as unrelated). If that classification error were correlated with the pricing error, then biased estimates would have been obtained. We indirectly control for this possibility below by instrumenting-out the related variable without qualitative changes in our results. Second, the notary acts we use were legal documents; any misrepresentation would have implied serious consequences in terms of titles of ownership, guarantees, compensation in case of emancipation, ... A prospective related buyer would have undoubtedly weighted the cost of a higher price by letting his identity be public against the costs of mis-representation. Finally, given the small size of the Mauritian market, it appears doubtful that such hiding strategies would have been successful.

The direct consequence of combining Assumptions 1 and 2 with Results 1 and 2 is straightforward. If the related buyer acquires the slave at the end of the bidding process and if other bidders believe his actions are somehow motivated by a high common value, then the price paid by the related buyer will be higher, reflecting the informational asymmetry. Clearly if information is perfectly symmetric across bidders and/or if the slave's value to the related bidder is purely private, the latter's actions should be inconsequential.

More formally, let w_s denote whether the winner of the auction for slave s is related ($w_s = 1$), or not ($w_s = 0$). We are interested in testing if w_s has some predictive power for the winning bid $p_s \equiv \log(P_s)$.[13] If f denotes some probability function and $\boldsymbol{X}_s$ a vector of exogenous variables which explain the winning bid, then we say there is no residual information asymmetry if w_s has no predictive power for p_s:

$$f\left(p_s \mid \boldsymbol{X}_s, w_s\right) = f(p_s \mid \boldsymbol{X}_s). \tag{10}$$

Assuming a simple hedonic price function we have that:

$$p_s = \boldsymbol{X}_s \boldsymbol{\beta} + w_s\, \gamma + \varepsilon_s. \tag{11}$$

[13]Note that the notarial acts document the winner of the auction but not the sequence of bids.

where $\boldsymbol{\beta}$ and γ are parameters and ε_s is an error term. A test of the null hypothesis of no residual information asymmetry is then simply a test of $H_0 : \gamma = 0$.

However, w_s is potentially correlated with the unobservable characteristics of the slave and ordinary least square estimates of the parameters in (11) could be biased. One approach is to find a valid instrument for w_s which is not correlated with the error term ε_s. Letting $\boldsymbol{Z}_s$ denote the vector of explanatory variables which determine whether the winner of the auction s is a related buyer and ν_s a mean-zero normally distributed random error term, we have that:

$$w_s = \begin{cases} 1 & \text{if } \nu_s > -\boldsymbol{Z}_s\boldsymbol{\theta} \\ 0 & \text{if } \nu_s < -\boldsymbol{Z}_s\boldsymbol{\theta} \end{cases} \tag{12}$$

In other words, a related buyer wins the auction if there are net positive benefits for him or her.

The vector of explanatory variables $\boldsymbol{Z}_s$ must contain identifying variables which are correlated with w_s but are not correlated with the error term in (11). Assume the winning bid should reflect the expected lifetime productivity of the slave. In this case, variables which do not measure the slave's productivity and which appear in the notarial act should not influence the value of the winning bid. One such possible identifying variable is the number of heirs: *ceteris paribus* observing more or fewer heirs should not affect a slave's productivity. However, if there are more heirs, one of them would be more likely be willing or would have the means to buy the slave. As a result, we use the number of heirs as an instrument for the related-buyer variable.

For robustness reasons we extend our empirical analysis to the tests for residual information asymmetry proposed by Chiappori and Salanié (2000) and Dionne et al. (2001)

in the context of insurance markets. An adaptation of the Chiappori and Salanié (2000) test means we would have to simultaneously estimate (12) and

$$p_s = \boldsymbol{X}_s\boldsymbol{\beta} + \eta_s.$$

A correlation between w_s and p_s given, $\boldsymbol{X}_s$, would then be equivalent to ν_s and η_s being correlated. Moreover, Dionne et al. (2001) point out that (10) is equivalent to:

$$f\left(w_s, p_s \mid \boldsymbol{X}_s\right) = f\left(w_s \mid \boldsymbol{X}_s\right) f\left(p_s \mid \boldsymbol{X}_s\right). \tag{13}$$

This additional relationship shows the symmetry in w_s and p_s of the conditional independence in our context. In a parametric formulation of winning auction prices distribution, as given by (11), the conditional independence between w_s and p_s, given $\boldsymbol{X}_s$, is obtained when $\gamma = 0$ in (11). Nonetheless, the null hypothesis of no residual information asymmetry can be rejected because (11) is mis-specified. Dionne et al. (2001) show that one way to avoid this problem is to add the conditional expectation of w_s as an explanatory variable in (11). In our case, using (11) this means we should estimate:

$$p_s = \boldsymbol{X}_s\boldsymbol{\beta} + w_s\gamma + \mathrm{E}(w_s|\boldsymbol{Z}_s)\delta + \varepsilon_s, \tag{14}$$

where E is an expectation operator and δ is a parameter. Again, a test of the null hypothesis of no information asymmetry can be devised as a test for $H_0 : \gamma = 0$.

The control variables in $\boldsymbol{X}_s$ that we include are mainly determined by the availability of data, existing literature and likely relevance. They can be separated between slave-specific characteristics, sale-specific components and timing elements:

- Slave-specific characteristics:
  - Age: We expect the usual concave relationship between age and prices that is well documented in the literature;
  - Gender: As shown in the primary statistics, there appears to be a significant premium for male slaves;
  - Ethnicity: Chenny et al. (2003) showed that the ethnicity of the slave had a strong influence on prices, most likely through its impact on resistance to illness, physical strength, . . . ;
  - Occupation: As a sizeable share of slaves were employed in skilled work, we expect a premium on this variable;
- Sale-specific characteristics:
  - Presence of children: Children, who under *Code Noir* had to be sold with their mother, should increase the price. As found by Chenny et al. (2003), we expect a different impact depending on the age of children involved.
- Timing elements:
  - Years: As can be see in Figure 4, prices displayed considerable medium-term movements across years, peaking at about 1830. We plan to capture those movements through time dummies.

– Semesters: As most slaves were involved in agricultural activities, a seasonal component to slave demand is expected.

Since related buyers were found to be almost completely absent from voluntary sales, we focus on involuntary sales (bankruptcy + succession). From the original sample of 4,286 slaves, we are left with 1,812 sales for which the information in all the variables (winning bids, related bidder, slave characteristics, motivation for sale) is complete, and 1,212 cases where in addition, we have the information on the number of heirs which is used as instrument.[14] The omitted data from the original sample was mainly caused by illegible handwriting or acts that were too deteriorated to be readable. As these were likely purely random events, there is no reason to suspect systematic under-reporting and sample selection bias.

4.2 Results

The results of the multivariate tests for information asymmetry are reported in Table 6. For the sake of comparison with the literature we start with the OLS estimates of the price equation without conditioning on the information of the buyer. We then augment that equation with a dummy variable which captures the identity of the buyer (related or unrelated). This varable is significantly positive.

As discussed in Section 4.1, observing that a buyer is related to the seller is likely to be correlated with the unobserved characteristics of the slave. Indeed, the Durbin-Wu-Haussman test strongly rejects the null hypothesis that the related buyer is exogenous

[14] Since the owner was, by definition, alive at the time of the auction, the number of heirs is unlikely to have been listed in voluntary sales, a further reason why we choose to focus on involuntary sales only.

with a value of 10.76 and a p-value of 0.001. We therefore estimate the price equation by two-stage least squares (2SLS) where the number of heirs is used as the instrument. Once again, a related buyer pays a significantly positive premium. However, given that relatedness between the buyer and the seller is measured by a dummy variable, it may be inappropriate to use 2SLS. We therefore estimate the system of equation by full information maximum likelihood (FIML) without any qualitative change in the results. Both sets of estimates strongly reject the hypothesis that related buyers pay the same price as unrelated ones. The tests drawn from Chiappori and Salanié (2000) also support residual information asymmetry in the market. The correlation of the residuals between the error term of the probit equation for whether the buyer is related or unrelated and the error term of the price equation equals 0.098 with a p-value of 0.001. The results obtained by using the specification advocated by Dionne et al. (2001), equation (14), which are reported in the last column of Table 6 (DGV), indicate that related buyers pay a statistically significant premium compared to unrelated ones.

Hence, all the tests strongly reject the null hypothesis that a related buyer does not pay a premium when buying a slave. In other words, the presence of a related buyer with superior information leads to higher equilibrium prices, consistent with Result 2. Based on the FIML point estimates, we can estimate the related buyer premium at 23% ($0.373/\mathrm{E}(Informed)-1$), i.e. a related buyer would have ended up paying close to $1/4^{th}$ more for a slave, controlling for slave characteristics and the timing of the sale. From our theoretical analysis of auctions, we attribute this significant premium to the more aggressive bidding from unrelated bidders when a related bidder was trying to acquire the slave, and, consequently, to the higher price a related bidder would have to pay to acquire the slave. This interpretation would be consistent with strong informational asymmetries between the two groups.

A valid concern may be that some situations where a related buyer ended up purchasing the slave could correspond to competition among many related bidders that would push up the prices. In this case, higher prices for related buyers would not be the result of positive signals to unrelated bidders. Since we have no information on the actual bidding process, it is not possible to verify whether or not these instances may have taken place. However, it is doubtful that *only* related bidders would have participated in the auction. Monte-Carlo simulations with many informed bidders and uninformed ones reveal that those cases would only *re-enforce* the signalling effect of related bidding.[15] Uninformed bidders seeing many informed bidders compete for a slave would rightfully conclude that not all of these bids could be motivated by high private value alone, and would revise upwards their Bayesian estimate of the common value of the slave, and increase their bids even further.

Similarly, the relationship between a seller and a related bidder raises a possibility of market manipulation. For instance, a group of heirs might collude to simulate interest in a particular slave so as to raise prices, dropping out of the auction process at the last moment. In our setting however, the market manipulation argument does not apply since the related buyer *actually ended up* purchasing the slave.

Turning to the other variables, it is of interest to note that the additional determinants of the price of a slave are consistent with priors and/or with the literature. First, the number of heirs significantly increase the probability that a related bidder will end up

[15]These simulations can be obtained upon request.

buying the slave. We attribute this effect to an increased likelihood that one of the heirs will have both the desire and financial means to acquire the auctioned slave.

Second, we find the expected correlation between determinants of physical strength and productive capacity. We identify a concave relation between age and price. A slave was most highly priced at age 24.4, which is very close to the estimates reported in the literature for the U.S. (Kotlikoff, 1979) and Peru (Newland and San Segundo, 1996). Also, a male slave fetched a premium of 10% compared to a female one. This estimate confirms findings that Mauritian female slaves were sold at a discount, reflecting lower labor productivity rather than reproductive potential (Scarr, 1998, p. 161). Interestingly, our estimated male premium is the same as the one found for the Southern US Kotlikoff (1979), very close to that for Jamaica (12% in 1817, Higman, 1976, p. 192) and close to the lower estimates for the West Indies (10% to 25%, Ward, 1988, fn. 60, p. 34). Unsurprisingly, handicapped slaves imposed a hefty discount. Moreover, we also find a significant discount on non-native slaves; all slaves other than Creoles were sold at a discount, in particular Indian slaves who were considered as of smaller size and lower strength compared to African-born slaves. The premium on Creoles most likely reflect better adaptability to the conditions on the island.

Third, our estimates further confirm that children purchased with their mother were highly valued. Kotlikoff (1979) also finds that slave bundle prices increase with the age of children for the New Orleans market. Low birth rates and high mortality at birth (Benedict, 1980; Valentine, 2000) are possible explanations of this high child premium. Moreover, the premium for children who are older than five is higher than for those who are at most five. This difference may reflect the high mortality rates of younger children and output lost when a female is caring for a young infant (Barker, 1996, p. 95). Finally, human capital was valued positively: skilled slaves fetched a premium of 17% compared to agricultural slaves and of 13% compared to household slaves. These premia are lower than those in the US and Peru, but similar to those for Cuban slaves.[16]

Finally, our estimates reveal a significant time variation in slave prices. We identify a clear concave pattern with average prices peaking in 1829 and falling thereafter (see Figure 4). Note however that seasonality does not appear to be a major factor; all loadings on quarters during which the sale takes place are insignificant.

4.3 From information asymmetry to adverse selection?

As mentioned earlier, informational asymmetry is necessary, but not sufficient for adverse selection. Our results unambiguously indicate that the former was present and thus that the latter was potential. In order to gain further insight on this issue, we follow the literature in focusing on the motivation for the sale.

Pritchett and Chamberlain (1993) argue that it is unlikely that succession sales were motivated by hidden defects of the slaves. The death of the owner is a random event, uncorrelated with the quality of his slaves. As such, succession sales would probably be the least subject to adverse selection and the price would be more closely aligned with the productive capacities inferred from the slave's observable characteristics. In comparison, slave owners should be inclined to voluntarily sell slaves with unobservable defects (propensity to flee, to illness, low work intensity, ...). Contrary to a succession,

[16] Kotlikoff (1979) for the US and Newland and San Segundo (1996) for Peru find a skill premium varying between 43 and 46%. Bergad et al. (1995), pp. 72-77, report that a 1819 Cuban field hand sold for 467 Spanish pesos, whereas a carpenter sold for 525.

voluntary sales did not involve the forced liquidation of all assets. Low-productivity slaves might therefore have been brought to the auction, with high-productivity ones retained by the owners. This suggests that adverse selection would have been the most severe in voluntary sales and the least severe in succession sales. Consequently, slaves sold voluntarily should fetch lower prices than those who are sold during succession sales.

To test this hypothesis, we follow Greenwald and Glasspiegel (1983) in distinguishing between prime-aged field slaves who are aged 15 to 35 and work as laborers (*pioche*), from other slaves, in order to reduce heterogeneity. The t-tests for equality of prices between voluntary and succession slaves are reported in the top panel of Table 7. We strongly reject the null hypothesis that both are equal for the whole sample and when we consider the 1825-1830 and 1831-1835 sub-periods. Prime-aged slaves sold during succession sales earn a premium of 45% compared to those sold voluntarily. Our premium is much higher than the 10% computed by Pritchett and Chamberlain (1993), Table 1, in New Orleans between 1830 and 1860, a value they find is not statistically different from 0.

We might therefore be tempted in concluding that adverse selection was indeed present in the Mauritian slave market. However, a more careful analysis of the voluntary and involuntary sales sub-samples suggests a different interpretation. From Table 5, we found earlier that related buyers are almost completely absent from voluntary sales. Indeed from the 21 out of 221 occasions in which a slave was purchased by a related buyer, 14 were actually buy-backs from the original owner who was either dissatisfied with the bids, or had to cancel a former sale due to hidden defects. Put differently, differences in prices between the two markets were likely caused by *self*- rather than adverse selection. Related buyers were simply more present in succession sales than in voluntary sales. As our previous theoretical and empirical results show, their sole active presence would have been sufficient to induce more aggressive bidding in involuntary sales. The findings of Pritchett and Chamberlain (1993) that prices were not different could be explained by such differences in samples composition. Related bidders could have been present in both markets, and/or their informational impact could have been diluted in the larger, and geographically more extended New Orleans market. Additional data would be required to provide a more definitive answer to this question, an issue which we leave on the research agenda.

References

Akerlof, George A. (1970) 'The market for lemons: Quality uncertainty and the market mechanism.' *Quarterly Journal of Economics* 84(3), 488–500

Allen, Richard B. (1999) *Slaves, Freedmen and Indentured Laborers in Colonial Mauritius* (Cambridge, UK: Cambridge University Press)

_ (2001) 'A traffic of several nations: the Mauritian slave trade, 1721–1835.' In *History, memory and identity,* ed. Vijaya Teelock and Edward A. Alpers (University of Mauritius: Centre for African Studies)

Barker, Anthony J. (1996) *Slavery and Antislavery in Mauritius, 1810–33: the Conflict between Economic Expansion and Humanitarian Reform under British Rule* (Houndmills: MacMillan)

Benedict, Burton (1980) 'Slavery and indenture in Mauritius and Seychelles.' In *Asian and African systems of slavery,* ed. James L. Watson (Oxford: Basil Blackwell) chapter 6, pp. 135–68

Bergad, Laird W., Fe Iglesias García, and Mariá del Carmen Barcia (1995) *The Cuban Slave Market, 1790–1880* (Cambridge; New York: Cambridge University Press)

Burroughs, Peter (1976) 'The Mauritius rebellion of 1832 and the abolition of British colonial slavery.' *Journal of Imperial and Commonwealth History* 4(3), 243–65

Chenny, Shirley, Pascal St-Amour, and Désiré Vencatachellum (2003) 'Slave prices from succession and bankruptcy sales in Mauritius, 1825–1827.' *Explorations in Economic History* 40(3), 419–442

Chiappori, Pierre-André, and Bernard Salanié (2000) 'Testing for asymmetric information in insurance markets.' *Journal of Political Economy* 108(1), 56–78

Choo, Eugene, and Jean Eid (2004) 'Interregional price differences in the New Orleans' auctions market for slaves.' mimeo, University of Toronto, July

Clarence-Smith, William Gervase (1989) *The Economics of the Indian Ocean Slave Trade in the Nineteenth Century* (London and Totowa N.J.: Frank Cass and Company Limited)

Dionne, Georges, Christian Gourieroux, and Charles Vanasse (2001) 'Testing for evidence of adverse selection in the automobile insurance market: A comment.' *Journal of Political Economy* 109(2), 444–453

Fede, Andrew (1987) 'Legal protection for slave buyers in the U.S. South: A caveat concerning *Caveat Emptor*.' *American Journal of Legal History* 31(4), 1987

Fogel, Robert W. (1989) *Without Consent or Contract: The Rise and Fall of American Slavery* (New York: Norton)

Fogel, Robert W., and Stanley L. Engerman (1974) *Time on the Cross: The Economics of American Negro Slavery* (Boston, Mass.; Toronto, Ont.: Little Brown)

Freudenberger, Herman, and Jonathan B. Pritchett (1991) 'The domestic United States slave trade: New evidence.' *Journal of Interdisciplinary History* 21(3), 447–477

Government of Mauritius (1824) *Recueil des Lois, Proclamations, Notes et Avis du Gouvernement* (Île Maurice: Imprimerie de Mallac, Fils et Frères). Lieutenant-General, The Honorable Sir Galbraith Lowry Cole, Governor and Commander In Chief of the Island of Mauritius and Dependencies

Greenwald, Bruce C., and Robert R. Glasspiegel (1983) 'Adverse selection in the market for slaves: New Orleans, 1830–1860.' *Quarterly Journal of Economics* 98(3), 479–99

Hernando-Veciana, Ángel, and Michael Tröge (2004) 'The insider's curse.' mimeo, Universidad de Alicante and University College London, March

Higman, Barry W. (1976) *Slave Population and Economy in Jamaica, 1807–1834* (Cambridge; New York: Cambridge University Press)

Hong, Han, and Matthew Shum (2003) 'Econometric models of asymmetric ascending auctions.' *Journal of Econometrics* 112(2), 327–358

Jehiel, Philippe, and Benny Moldovanu (2001) 'Efficient design with interdependent valuations.' *Econometrica* 69(5), 1237–1259

Kotlikoff, Laurence J. (1979) 'The structure of slave prices in New Orleans, 1804 to 1862.' *Economic Inquiry* 17(4), 496–518

_ (1992) 'Quantitative description of the New Orleans slave market, 1804 to 1862.' In *Without consent or contract: the rise and fall of American slavery: markets and production: technical papers,* ed. Robert W. Fogel and Stanley L. Engerman, vol. 1 (New York: W.M. Norton) pp. 31–53

Krishna, Vijay (2003) 'Asymmetric english auctions.' *Journal of Economic Theory* 112(2), 261–268

Mancall, Peter C., Joshua L. Rosenbloom, and Thomas Weiss (2001) 'Slave prices and the South Carolina economy, 1722–1809.' *Journal of Economic History* 61(3), 616–39

Maskin, Eric (1992) 'Auctions and privatization.' In *Privatization: Symposium in honor of Herbert Giersch,* ed. Horst Siebert Siebeck Tubingen: Mohr

_ (2004) 'The unity of auction theory: Milgrom's masterclass.' *Journal of Economic Literature* 42(4), 1102–1115

Milgrom, Paul R. (2004) *Putting auction theory to work* Churchill Lectures in Economics (Cambridge; New York and Melbourne: Cambridge University Press)

Milgrom, Paul R., and Robert J. Weber (1982) 'A theory of auctions and competitive bidding.' *Econometrica* 50(5), 1089–1122

Newland, Carlos, and Maria Jesus San Segundo (1996) 'Human capital and other determinants of the price life cycle of a slave: Peru and La Plata in the Eighteenth century.' *Journal of Economic History* 56(3), 694–701

Nwulia, Moses D. (1981) *The History of Slavery in Mauritius and the Seychelles* (Rutherford, N.J.: Fairleigh Dickenson University Press)

Officer, Lawrence H. (2001) 'Exchange rate between the United States dollar and the British pound, 1791-2000.' Economic History Services, EH.Net. http://www.eh.net/hmit/exchangerates/pound.php

Pritchett, Jonathan B., and Herman Freudenberger (1992) 'A peculiar sample: The selection of slaves for the New Orleans market.' *Journal of Economic History* 52(1), 109–127

Pritchett, Jonathan B., and Richard M. Chamberlain (1993) 'Selection in the market for slaves: New Orleans, 1830–1860.' *Quarterly Journal of Economics* 108(2), 461–73

Scarr, Deryck (1998) *Slaving and Slavery in the Indian Ocean* (New York: St.Martin's Press)

Teelock, Vijaya (1998) *Bitter Sugar: Sugar and Slavery in 19th Century Mauritius* (Moka, Mauritius: Mahatma Gandhi Institute)

Telfair, Charles (1830) *Some Account of the State of Slavery at Mauritius since the British Occupation in 1810; In Refutation of Anonymous Charges Promulgated Against Government and that Colony* (Port-Louis, Mauritius: J. Vallet and V. Asselin)

Valentine, Barbara (2000) 'The dark soul of the people: slaves in Mauritius.' Working Paper 0102, Rhodes University. South African Data Archive

Wahl, Jenny B. (1996) 'The jurisprucence of American slave sales.' *Journal of Economic History* 56(1), 143–69

Ward, J.R. (1988) *British West Indian Slavery, 1750–1834: The Process of Amelioration* (Oxford: Clarendon Press)

Wilson, Robert (1998) 'Sequential equilibria of asymmetric ascending auctions: The case of log-normal distributions.' *Economic Theory* 12(2), 433–440

Appendix

A Overview of the Wilson (1998) model

A.1 Closed-form equilibrium bids

For completeness, we reproduce the closed-form expressions for the Bayesian-Nash equilibrium bids from Hong and Shum (2003). The distributional assumptions governing value and signals can be written as:

$$\begin{pmatrix} v_i \\ \boldsymbol{x} \end{pmatrix} \sim N.I.D. \left[\begin{pmatrix} \mu_i \\ \boldsymbol{\mu}^* \end{pmatrix}, \begin{pmatrix} \sigma_i^2 & \boldsymbol{\sigma}^{*\prime}_i \\ \boldsymbol{\sigma}_i^* & \boldsymbol{\Sigma}^* \end{pmatrix} \right] \tag{15}$$

where $\boldsymbol{x}$ is the $N \times 1$ signal vector, with:

- $\boldsymbol{x}_r^k$ is the $(N-k) \times 1$ vector of unobserved signals after k bids have occurred and k bidders have exited and $\boldsymbol{x}_d^k$ is the $k \times 1$ vector of observed signals;
- $\boldsymbol{\Sigma}_{k,1}^{*-1}$ is the $(N-k) \times N$ partition of the inverse of the covariance matrix in (15) corresponding to the $N-k$ remaining bidders. $\boldsymbol{\Sigma}_{k,2}^{*-1}$ is the $k \times N$ partition corresponding to the k bidders who have exited;
- $\boldsymbol{l}_k$ is the $N-k$ unit vector, $\boldsymbol{\mu}_k \equiv (u_1, \ldots u_{N-k})'$, $\boldsymbol{\Gamma}_k \equiv (\sigma_1^2, \ldots \sigma_{N-k}^2)'$ and $\boldsymbol{\Lambda}_k \equiv (\boldsymbol{\sigma}_1^*, \ldots \boldsymbol{\sigma}_{N-k}^*)$.

Define:

$$\boldsymbol{A}^k \equiv (\boldsymbol{\Lambda}_k \boldsymbol{\Sigma}_{k,1}^{*-1})^{-1} \boldsymbol{l}_k; \tag{16}$$

$$\boldsymbol{C}^k \equiv 1/2(\boldsymbol{\Lambda}_k \boldsymbol{\Sigma}_{k,1}^{*-1})^{-1}(\boldsymbol{\Gamma}_k - \mathrm{Diag}(\boldsymbol{\Lambda}_k \boldsymbol{\Sigma}^{*-1} \boldsymbol{\Lambda}_k') + 2\boldsymbol{\mu}_k - 2\boldsymbol{\Lambda}_k \boldsymbol{\Sigma}^{*-1} \boldsymbol{\mu}^*); \tag{17}$$

$$\boldsymbol{D}^k \equiv (\boldsymbol{\Lambda}_k \boldsymbol{\Sigma}_{k,1}^{*-1})^{-1}(\boldsymbol{\Lambda}_k \boldsymbol{\Sigma}_{k,2}^{*-1}). \tag{18}$$

Take the i^{th} row of each and substitute in (6) to obtain the optimal bids.

A.2 Monte-Carlo experiment details

We select a number of participants ($N = 30$); distribution laws for the fixed parameters ($U(0,1)$); and a number of iterations ($T = 5000$). In accordance with the model, the error terms are drawn from Gaussian distributions. Then, at each iteration $j = 1, \ldots T$ we:

1. generate the fixed parameters $\bar{a}_i, t_i, m, r_0, s_i$ from $U(0,1)$;
2. generate the errors process $\epsilon_{a_i}, \epsilon_v, \epsilon_{x_i}$ from a Gaussian distribution corresponding to the generated scedastic structure in step 1;
3. use (6) to compute the equilibrium bids for each bidder i, at each round k and for each iteration j, first without $b^0(i,k,j)$ and then with an informed bidder $b^1(i,k,j)$.

Finally, we compute the informed bidder premium π, defined as the difference between all agents' bids with and without informed bidder:

$$\pi(i,k,j) \equiv b^1(i,k,j) - b^0(i,k,j), \quad \forall i,k = 1, \ldots N$$

We subsequently focus on the median premium $\hat{\pi}(i,k) \equiv \text{Median}(\pi(i,k,:))$ to obtain the desired prediction for the empirical part of our study.

The number of participants is arbitrarily set at 30 (we verify robustness to that choice below). Moreover, the parameters of the model are generated at each iteration. This ensures that our results are not dependent on a specific parameter set, but are robust to very general parametric specifications. In addition, we resort to variance reduction techniques (antithetic variates) to augment precision, such that our results actually correspond to a much larger number of replications than $T = 5,000$. Also, the identity of the informed bidder is arbitrarily chosen such that he sometimes wins the auction and sometimes doesn't. Finally, in Appendix A.3 we check for the robustness of our results by sequentially changing the number of participants and the distributional laws for the fixed distribution parameters.

A.3 Robustness check

In Figure 2, we consider comparative statics exercises where we successively change the assumptions generating the fixed parameters. For this analysis we focus exclusively on the maximum bid. Since bids are ordered in descending order, this corresponds to $\pi(1,k,j) \equiv b^1(1,k,j) - b^0(1,k,j)$. First, in panel A we increase $\bar{a}_i \to 5 \times \bar{a}_i, \forall i$. This implies that the mean *private* value component of total value becomes more important relative to the *common* value and that the mean total value and signal are also higher. Conversely, the variances of both value and signal remain unaffected. The impact is to shift outwards the informed bidder premium which becomes more important. Second, in panel B we increase $m \to 5 \times m$. This results in an increase in the mean *common* value, with variances again unaffected. This variable has no apparent impact on our benchmark results. An increase in $\bar{a}_i$ raises the mean levels of high-value bidders more than those of low-value bidders. In comparison, an increase in m has an uniform effect on all bidders' mean valuation. Consequently, the effect on the highest value bidder is greater than in the second case.

Third, in panel C, we increase $t_i \rightarrow 2 \times t_i, \forall i$, thereby increasing the variance of the private component of both total value and signal, while means remain unchanged. This results in lowering the premium, which nonetheless remains positive. Bidders become more uncertain regarding the informed bidder's private value; the latter could remain active because of a large private value which is irrelevant to other bidders, i.e. the winner's curse risk is greater. Fourth, in panel D we increase $r_0 \rightarrow 2 \times r_0$. This raises the standard error on the common value. This also has a positive impact on the premium, since agents are more uncertain concerning the mean common value. Any signal inferred from the informed bidder's action is therefore more valuable.

Fifth, in panel E we increase $s_i \rightarrow 2 \times s_i, \forall i$ so as to increase the overall variance of the signals on common value without affecting the means. This implies that the signals agents receive become less informative. Consequently the information revealed by the informed bidder's decision becomes more important and the premium increases strongly. Finally, in panel F we increase $N \rightarrow 1.5N$. Augmenting the number of participants from 30 to 45 shifts the informed bidder outwards. It might have been argued that the informed bidder effect could have been diluted by having more bidders. Our results show that this is not the case.

B Figures

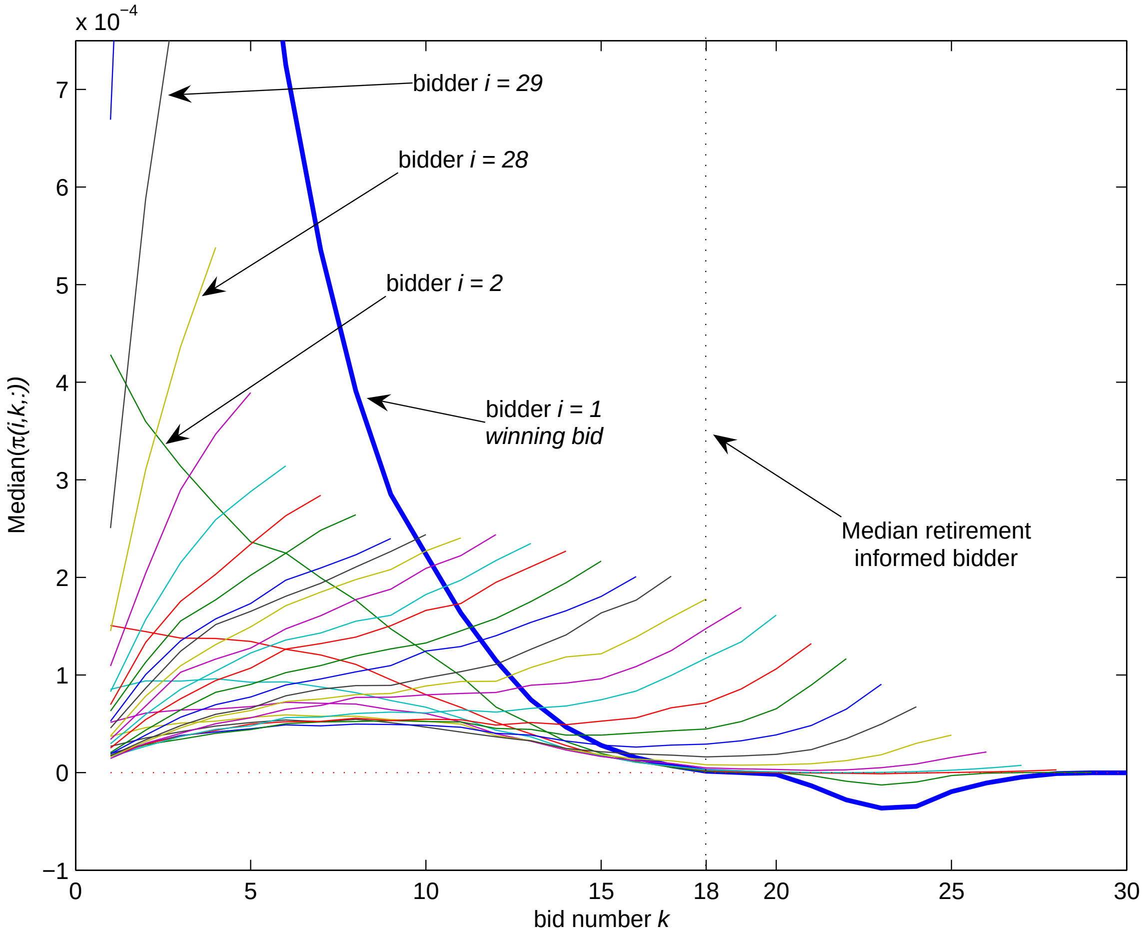

Figure 1: Median Informed Bidder Premium

Note: Each line corresponds to the median informed bidder premium Median$(\pi(i,k,:))$, where $\pi(i,k,j)$ is given in (9) and the premium is calculated for each agent $i = 1,\ldots,30$, and at each round k. The thick line corresponds to the maximum bid $i = 1$ and defines our benchmark case used in the subsequent comparative robustness analysis.

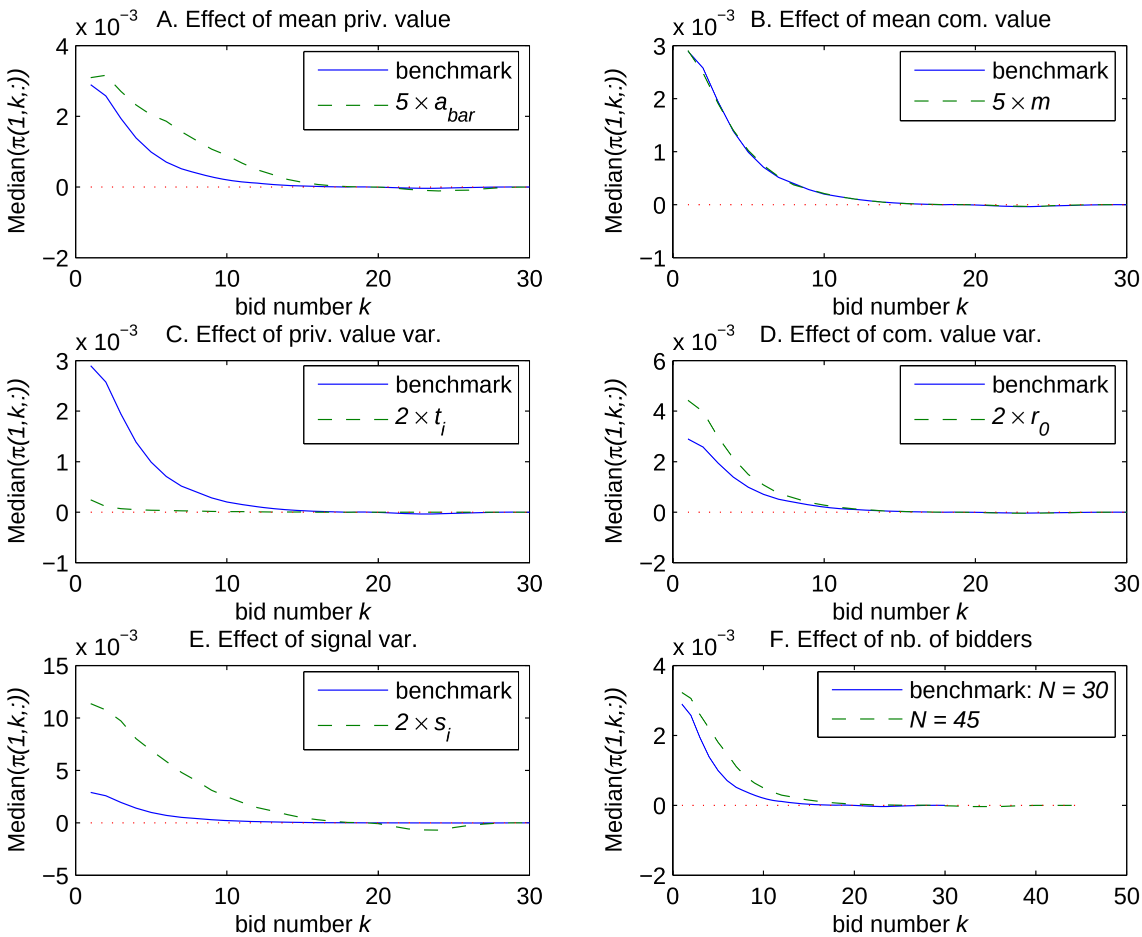

Figure 2: Median Informed Bidder Premium: Effects of Parameters

Note: The median informed bidder premium is Median$(\pi(i, k, :))$, where $\pi(i, k, j)$ is given in (9) and the premium is calculated for the maximum bid $i = 1$ and at each round k. The solid line corresponds to our benchmark specification while the dashed line varies one parameter in turn.

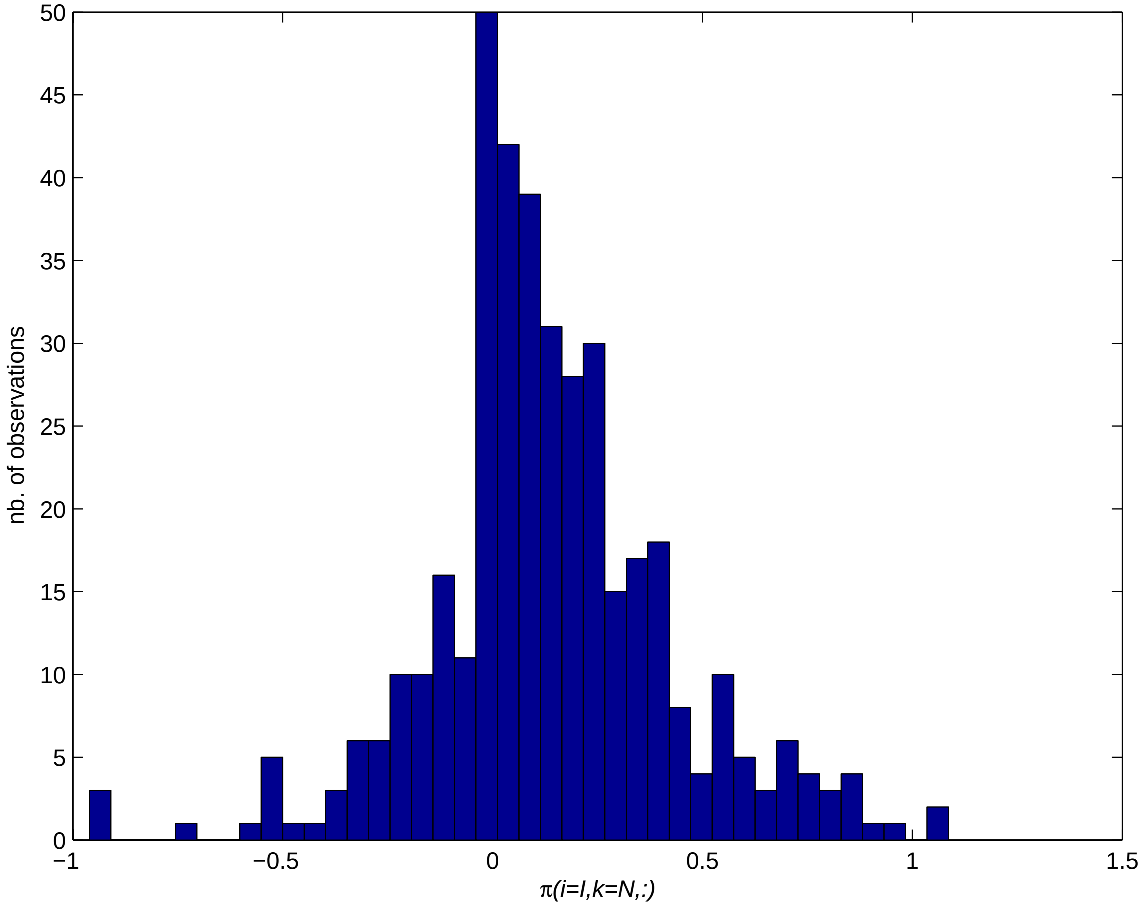

Figure 3: Distribution of Informed Bidder Premium Conditional on I winning the Auction

Note: The informed bidder premium is $\pi(i, k, j)$ given in (9). It is calculated conditional on the informed bidder winning the auction, i.e. $i = I$, when $k = N$.

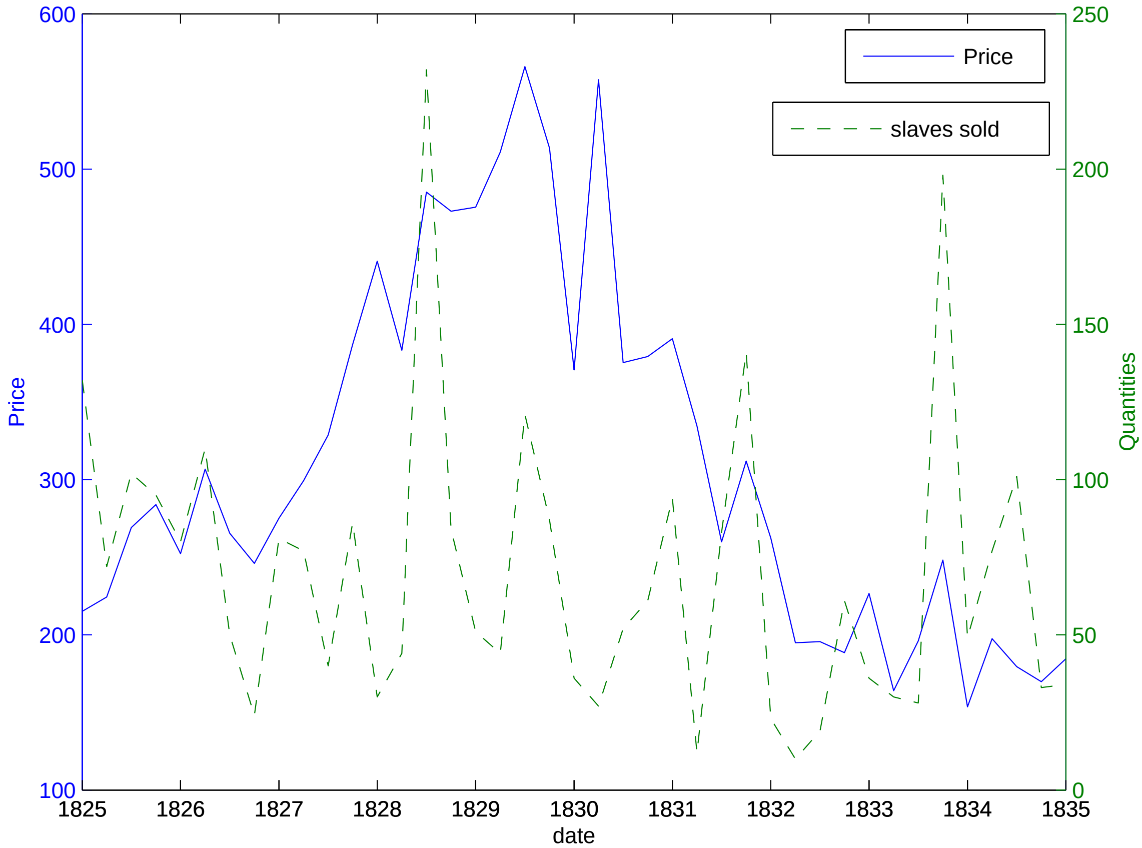

Figure 4: Average quarterly slave prices, quantity sold, Mauritius 1825-1835

Note: Solid line is mean quarterly slave prices (left-hand scale). Dashed line is number of slaves sold during public auctions (right-hand scale).

C Tables

Table 1: Distribution of sales by notaries

Archive Num.	Notary	District	Active	Nb. of auctions 25-29	30-35	25-35	Nb. of slaves sold 25-29	30-35	25-35
NA 42	TOUSSAINT	Grand Port	1791-1831	13		13	125		125
NA 63	DUBOR, Louis-Joseph Senoni	Port Louis	1819-1830	37	3	40	269	34	303
NA 66	MONTOCCHIO, Jean Charles	Flacq	1822-1874	10	6	16	140	78	218
NA 67	JOLLIVET, Yves Isidore	Port-Louis	1822-1857	35	43	78	183	511	694
NA 68	BUSSIÉ, Jean-Paul	Port-Louis	1823-1832	38	24	62	221	182	403
NA 69	ARNAUD, Charles	Port-Louis	1823-1833	24	8	32	444	129	573
NA 71	BELIN, Jean	Port-Louis	1824-1827	5		5	33		33
NA 72	BONNEFIN, Alexandre	Port-Louis	1825-1833	110	41	151	703	142	845
NA 73	BONSERGENT, Théodore	Port-Louis	1825-1828	17		17	43		43
NA 74	DEROULLEDE, L. E.	Port-Louis	1828-1837	12	33	45	141	148	289
NA 75	GIBLOT-DUCRAY, J. M. R.	See note 1	1829-1873	1	14	15	29	85	114
NA 76	MAIGNARD, Louis Charlemagne	Port Louis	1830-1839		34	34		197	197
NA 77	ERNY, Amédée	See note 2	1831-1837		24	24		271	271
NA 78	BOUIC, Jules	Port Louis	1833-1839		41	41		151	151
NA 79	TREBUCHET, Louis Antoine	Port Louis	1833-1842		7	7		27	27
		Total		302	278	580	2,331	1,955	4,286

Notes

NA Notary Archive number refers to the classification used at the Mauritius Archives.

1. Giblot-Ducray was based in Pamplemousses & Rivière du Rempart from 1829 to 1831 and then in Grand Port & Savanne between 1832 and 1842. He remained active until 1873 but the district after 1842 is not documented
2. Erny was based in Pamplemousses & Rivière du Rempart in 1831 and 1832. He then moved to Port Louis

Table 2: Comparison with the 1826 partial census

	Number of slaves				Average age			
	1826 Census		Notarial acts		1826 Census		Notarial Acts	
	Nb.	%	Nb.	%	Avg.	Std. Dev.	Avg.	Std. Dev.
All sample	20,467		4,013		25	14.3	28	15.0
Gender								
Male	11,671	57	2,724	64	26	14.0	30	14.5
Female	8,762	43	1,521	36	23	14.5	24	15.2
Missing			33					
Ethnic group								
Creole	10,364	51	2,015	52	17	12.1	19	12.9
Mozambique	5,581	28	995	26	34	10.8	38	9.7
Malagasy	3,666	18	717	19	31	11.3	34	9.9
Indian	669	3	135	3	44	12.6	47	10.4
Missing			424					

Note: See Valentine (2000) for a description of the partial 1826 census.

Table 3: Occupation and Ethnicity. Individual slave sales

1825 - 1835		Ethnic group										All ethnic groups	
Gender	Occupation	Creole		Mozambique		Malagasy		Indian		Unknown			
		Price	Num.	Price	Num.	Price	Num.	Price	Num.	Price	Num.	Price	Num.
Female	Skilled	108	2			229	8	106	1			196	11
	Laborer	378	64	188	49	298	19	109	13	126	5	274	150
	Household	345	203	243	36	354	63	197	23	313	20	325	345
	Unknown	246	69	149	17	216	16	111	11	219	14	214	127
	All	330	338	201	102	313	106	152	48	255	39	288	633
Male	Skilled	427	167	349	155	371	152	131	10	411	59	382	543
	Laborer	397	196	298	495	315	237	194	22	238	25	318	975
	Household	373	210	305	65	405	71	188	33	311	17	350	396
	Unknown	305	70	271	93	310	47	261	12	314	58	294	280
	All	387	643	305	808	344	507	193	77	337	159	337	2,194
All	Skilled	423	169	349	155	364	160	128	11	411	59	378	554
	Laborer	392	260	289	544	314	256	163	35	219	30	313	1,125
	Household	360	413	283	101	381	134	191	56	312	37	338	741
	Unknown	276	139	252	110	286	63	189	23	295	72	269	407
	All	367	981	294	910	339	613	177	125	321	198	326	2,827

Notes Average prices are in current piastres (5 piastres = £1 = $4.94US in 1827, Officer (2001)). The sample is restricted to individual slaves whose gender is known. We exclude heterogenous groups and mother-child bundles. The following occupations are recorded in the notarial acts are:

- Skilled slaves: Assistant blacksmith, blacksmith, barrel maker, carpenter, carpentry trainee, carter, commander, locksmith, mason, master carpenter, master mason, mattress maker, nailer, roofer, sack-maker, sawyer, shoemaker, squarer, stone cutter, stone cutter trainee, sugar-maker.
- Agriculture slaves: Chief gardener, gardener, laborer, marketman, stable-boy, watchman and sea-related activities: caulker, fisherman, sailor.
- Household slaves: Baker, cook, innkeeper, laundress, maid, messenger, nurse, seamstress, shoe polisher, tailor.

Table 4: Motivations for the sales

Year	Voluntary	Bankruptcy	Succession	Unknown	All
	Reasons for the aution				
1825	9	1	42	1	53
1826	9		37	1	47
1827	6	1	45	3	55
1828			57	11	66
1829			65	14	76
1830		2	41	1	42
1831		1	46	8	55
1832			35	7	41
1833	6	5	29	3	43
1834	19	10	36	15	80
1835	2	3	8	1	14
1825-35	51	23	441	65	572
Year	**Number of slaves sold by reason**				
1825	118	51	377	4	550
1826	58		309	6	373
1827	37	28	349	3	417
1828			459	66	525
1829			410	56	466
1830		3	234	53	290
1831		7	454	33	494
1832			168	24	192
1833	12	155	228	43	438
1834	53	124	226	96	499
1835	7	14	17	4	42
1825-35	256	382	3,231	388	4,286

Note Unknown means either the reason is not documented or the condition of the notarial act did not allow us to identify the reason for the sale.

Table 5: Related and Unrelated Buyers

Link between the owner and the buyer	Reasons for the sale: Voluntary	Bankruptcy	Sucession	Unknown	Total	Share
Family						25.7%
Wife			286		286	
Husband	9		189		191	
Son	1		177		178	
Son-in-law	1		76		77	
Daughter			69		69	
Grand-children			9		9	
Nephew and niece			9		9	
Brother		3	5		8	
Father			8		8	
Sister			7		7	
Brother-in-law			2		2	
Cousin			2		2	
Minor children			2		2	
Father-in-law			1		1	
Mother			1		1	
Buy back						1.0%
Original slave owner	14	7		7	28	
The slave		2	4		6	
						0.3%
Tenant			3		3	
Business partner			7		7	
						3.3%
Same last name	3	3	97	2	105	
Other			4		4	
						69.7%
No apparent link	200	314	1,530	260	2,304	
Total	221	329	2,488		3,307	

Notes

* Children sold with their mother are coded as one sale because they could not be sold, or bought, separately. We exclude group sales of slaves, i.e. heterogenous bundling of adult slaves.

** Other informed buyers include: a creditor, husband of the niece of the deceased, the notary, the testament executor (*fondé des pouvoirs*)

Table 6: Determinants of slave prices: Succession sales only

	OLS		2SLS		FIML		DGV
	Log of price		log price	Buyer	log price	Buyer	log price
Related buyer		0.056**	0.617**		0.373***		0.064**
		2.41	2.354		3.784		2.27
Exp. value of the informed dummy							0.594***
							2.93
Number of heirs				0.022***		0.072***	
				4.329		5.164	
Attributes							
Age	0.048***	0.050***	0.056***	-0.012**	0.053***	-0.035**	0.056***
	10.931	11.139	7.885	2.196	9.071	2.262	6.725
Age squared	-0.001***	-0.001***	-0.001***	0.000*	-0.001***	0.000*	-0.001***
	16.731	16.836	11.617	1.791	13.34	1.83	8.776
Male slave	0.093***	0.094***	0.096**	0.013	0.097***	0.04	0.096**
	3.353	3.378	2.385	0.383	2.676	0.414	2.437
Handicapped	-0.537***	-0.538***	-1.036***	-0.305	-1.112***	-5.808	
	4.421	4.436	2.639	0.908	3.18	0	
Ethnicity							
Mozambique	-0.058*	-0.067**	-0.124**	0.148***	-0.088**	0.443***	-0.130**
	1.852	2.126	2.053	3.639	1.975	3.866	2.345
Malagasy	-0.041	-0.045	-0.076*	0.053	-0.066	0.153	-0.078**
	1.39	1.506	1.667	1.374	1.628	1.39	2.06
Indian	-0.413***	-0.421***	-0.412***	0.08	-0.396***	0.223	-0.414***
	7.006	7.048	4.781	1.086	5.153	1.083	4.037
Mother-child bundling							
Num. of children not older than 5	0.242***	0.242***	0.269***	-0.048	0.257***	-0.136	0.272***
	8.217	8.218	5.483	1.157	5.95	1.136	6.789
Num. of children older than 5	0.389***	0.388***	0.356***	0.034	0.362***	0.086	0.355***
	9.044	9.039	5.567	0.613	6.286	0.552	6.112
Occupation							
Laborer and agriculture	-0.188***	-0.183***	-0.121**	-0.099**	-0.143***	-0.283**	-0.114**
	5.98	5.82	2.256	2.36	3.225	2.417	2.421
Household	-0.133***	-0.142***	-0.152**	0.108**	-0.124**	0.297**	-0.155***
	3.802	4.031	2.493	2.33	2.51	2.305	2.806
1826	0.054	0.046	0.045	0.011	0.047	0.074	0.036
	1.117	0.951	0.614	0.179	0.704	0.395	0.523
1827	0.380***	0.375***	0.242***	0.126**	0.269***	0.408**	0.234***
	8.536	8.443	3.21	2.055	4.194	2.369	4.031
1828	0.731***	0.708***	0.649***	0.121**	0.680***	0.375**	0.639***
	17.806	16.758	8.952	2.151	11.385	2.309	10.678
1829	0.842***	0.828***	0.790***	0.076	0.820***	0.251	0.779***
	20.118	19.668	11.088	1.349	14.006	1.557	13.536
1830	0.587***	0.578***	0.549***	0.106	0.580***	0.32	0.538***
	11.117	10.9	6.163	1.452	7.611	1.547	7.803
1831	0.313***	0.290***	0.195**	0.215***	0.251***	0.622***	0.179**
	7.735	7.012	2.277	4.008	4.187	4.003	2.457
1832	0.04	0.021	0.056	-0.002	0.062	0.105	0.05
	0.73	0.368	0.668	0.026	0.817	0.507	0.49
1833	-0.159***	-0.163***	-0.099	-0.170**	-0.133*	-0.563**	-0.099
	2.839	2.899	1.074	2.28	1.705	2.39	1.137
1834	-0.191***	-0.211***	-0.314***	0.200**	-0.251***	0.569**	-0.327***
	2.792	3.068	2.7	2.39	2.806	2.43	3.174
2nd Quarter	-0.072*	-0.068*	-0.045	-0.065	-0.061	-0.134	-0.048
	1.961	1.848	0.785	1.355	1.202	0.976	0.978
3rd Quarter	-0.005	-0.003	0.006	-0.044	-0.009	-0.078	0.004
	0.143	0.083	0.112	0.977	0.19	0.613	0.088
4th Quarter	0.034	0.029	-0.004	0.04	0.005	0.136	-0.008
	1.072	0.908	0.082	0.941	0.113	1.146	0.178
Constant	5.120***	5.090***	4.787***	0.390***	4.905***	-0.393	4.772***
	59.286	58.323	26.751	3.462	39.539	1.249	28.305
Number of observations	1812	1797	1212	1212	1212		1210
R-squared	0.579	0.58	0.421	0.097			

Notes *Related buyer* is a dummy variable which equals 1 if the buyer and the orignal slave owner are related and zero otherwise (see Table 4). The reference categories are: skilled workers for occupation (see Table 3 for the full list of occupations); creoles for ethnicity, 1825 for the year and the first quarter for semester. We use only succession sales from 1825 to 1834 in estimating the model. The lack of data prevents us from using sales for 1835.

The Durbin-Wu-Hausman Chi-Squared statistic for the null hypothesis that *Buyer is informed* is exogenous equals 10.76 and the corresponding P-Value is 0.001. Absolute value of T-ratios corrected for heteroscedasticity are reported under the point estimate; * denotes the parameter is significantly different from zero at 10%; ** significant at 5% and *** significant at 1%.

DGV denotes the specification based on Dionne, Gourieroux and Vanasse 2001

Table 7: Differences in slave prices, succession vs voluntary sales

Succession & voluntary sales	**Succession sales**		**Voluntary sales**		**T-test**	**Premium**
	Avg. price	Nb. of obs	Avg. price	Nb. of obs		
All males						
1825-1835	355	1,598	247	146	9.22	44%
1825-1830	400	1,080	267	117	9.81	50%
1831-1835	259	518	163	29	5.90	59%
Prime-aged field slaves	334	687	231	61	6.58	45%

Note: A prime-aged field slave is a male of age 15 to 35 who works in agriculture (*pioche* or other agricultural related tasks). Price is in piastres. The T-test is for the null hypothesis that prices for related and unrelated buyers (top panel), succession and voluntary sales (bottom panel), are equal.