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Auction hosts: are they really impartial?

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Abstract:

This study explores the impacts *i)* of marketing strategies implemented by auction houses and *ii)* of auctioneers' way of conducting auctions, on auction sale outcomes: the probability of sale, the final purchase price and the final price in percentage of the mean pre-sale estimated price. Using video recordings of art auction sales and a hand-collected database of 1101 auctioned artworks, we find firstly that the organizational and promotional work carried out by auction houses have an impact on different sale outcomes and secondly that the auctioneer's behavior seems to be decisive, especially the usage of humor. In this paper, we provide the first examination of the influence of professional auctioneers on auction prices. This research brings a more comprehensive understanding of bidders' behavior, the tactics through which auction houses and auctioneers affect outcomes, and the functioning of real-world auction markets. Moreover, the findings of this study yield useful managerial insights for marketers.

Keywords: auctioneer, auction house, strategy, art market, prices.

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1. Introduction

“In the back of my head, I’m not just representing Christie’s. I’m representing [...] all the staff who’ve got a piece consigned. [...] An awful lot of people go into the moment when I get up, and if I’m not on good form, all their hard work isn’t maximised” explained Hugh Edmeades, auctioneer at Christie’s for 35 years¹. This auctioneer recognizes the importance of marketing efforts in the auction house’s activity and of the auctioneer performance when conducting an auction sale. Auctioning seems thus to be more than simply collecting pieces from sellers and put them for sale, calling prices and being a money-collecting robot.

An auction is a common market mechanism with a defined set of rules used for allocating and pricing resources (McAfee and McMillan 1987). A wide and increasing range of markets are concerned, the most renowned being spectrum license, flowers in Holland, art and antiques, and Internet consumer auctions such as eBay. A large body of academic research has mostly discussed auction formats and revenues, sellers’ and bidders’ behaviors at auction, depending on the auction rules. Less have been done on the auction sale intermediary, *i.e.* the auction host, and especially few in marketing. It appears regularly in real auctions but also in the relevant literature that the seller holds the role of the auctioning agent, hence there is no third player. When there is an auction host, it can be an online auction website or a brick-and-mortar auction house for which a human professional auctioneer conducts auction sales. This paper empirically explores the impacts of marketing strategies implemented by auction houses and human auctioneers² on sale rates, on prices realized at auction, but also on the difference between the auction price and the pre-sale estimated price. Auction houses are independent businesses with their own interests that aim at maximising their profits. While actual auction houses’ and auctioneers’ practises have received little attention by the management science literature, our question is whether, and if so, how heterogeneity among auction houses’ organizational and promotional strategies and auctioneers’ behaviors determine the probability of sale, prices and price-estimate ratios for otherwise equivalent art pieces. To do so, we answer to three sub-questions that are still to be investigated. Should auction houses care about the organization of a sale and on what should they focus specifically? Is there a way to present or show off the works they have to sell in order to maximize revenues? Does the behavior of professional auctioneers have an impact on the outcome of item transactions and prices?

While this article draws upon two disciplines, marketing and economics, that both enrich our understanding of auctions, these questions will be answered from a marketing perspective. We use data

¹ The National, 02/05/2020. Hugh Edmeades has proceeded to more than 2 600 auctions, selling more than 310 000 lots for more than 2.75 billion of dollars.

² It is common to find in the literature the term “auctioneer” indistinguishable from the seller or to designate the auctioning agent (Hossain *et al.* 2013). In this paper, we call “auction house” a firm that auctions (at least partly) on-site, “auction platform” a firm that organizes online auction sales (such as eBay) and “auctioneer” the human professional in charge of conducting oral outcry auctions.

from English ascending auctions and apply our study to art market auction sales conducted by six different auction houses between March 2017 and May 2018 in Europe.

Our results show that auction houses should give particular attention to the organization of the sale, as many effects exert an influence upon the probability of sale and prices, like the level of competition with similar sales or the number of lots from the same artist. We find that the promotional work performed by auction houses has a significant and positive influence upon artwork prices, with the written positive comment ahead of the sale proving to be particularly decisive. Last, we observe a noteworthy influence of the auctioneer's interventions on outcomes. First, we find that the usage of humor by the auctioneer plays a relevant role in explaining the probability of sale and auction prices. Second, the price-estimate ratio turns out to be mostly determined by the auctioneer's behavior, whose role of salesman appears to be crucial in selling an entertaining auction experience to bidders in an atmosphere of trust.

The paper is organized in the following manner. Section 2 provides a review of the literature on the impact of auction hosts and develops the hypotheses. In section 3 we describe our dataset and methodology. Section 4 presents our results and analysis. Finally, conclusion, implications and future research on the auctioning agent are stated in section 5.

2. Existing auction host research and hypotheses

Since the 1961 seminal article of Vickrey, there has been a body of research about auction theory, questioning auction formats, auction revenues and optimal strategies for bidders (see Klemperer 1999 for a survey). However, the existing literature has given less attention to the one that can be considered as the third player of an auction sale: the auctioning agent. In many studies, no distinction is made between the seller and the auctioneer or this later is considered as a passive intermediary between the seller and the buyer. Auction hosts are companies that sell a marketplace for transactions between sellers and buyers. These intermediaries are in charge of connecting both parties, while being independent from them.

An auction host can take several actions that can have a notable economic impact. First of all, the auction host can influence outcomes by choosing the auction format. Different auction types can be used, but four basic types are widely adopted: the first-price sealed-bid auction, the second-price sealed-bid auction (also called the Vickrey auction), the ascending-bid auction (also called the open or English auction) and the descending-bid auction (also called the Dutch auction). The difference in realized prices depending on the auction format has been explored mostly theoretically. If bidders are risk-neutral and their valuations are independent, the expected selling price is the same for these four auction types (Myerson 1981; Riley and Samuelson 1981; Vickrey 1961). But, with risk aversion, the Dutch and first-price sealed-bid auctions yields larger expected prices than the English and second-price sealed-bid

auctions do (Harris and Raviv 1981; Holt 1980; Maskin and Riley 1980; Matthews 1980). Likewise, if bidders' valuations are not independent, the English auction produces higher prices than the second-price auction format, which in turn leads to higher prices than the Dutch and first-price auctions (Milgrom and Weber 1982). Also, asymmetries between bidders, even small, can substantially reduce the price paid by the winning bidder (Klemperer 1998). As we can see, the choice of an auction format by an auctioneer has major significance on realized prices, depending on bidders', sellers' and goods' characteristics. In practise however, in historical markets such as art and antiques, an auction house does not choose the auction format. The English auction format has been used for centuries. Furthermore, the auctioneer can intervene on the nature of bidding. For ascending-bid auctions, either the auctioneer raises prices continuously and bidders exit the auction gradually, or bidders submit by their own higher prices successively, thus allowing for jump bidding (submitting bids higher than the increment required by the auctioneer). These two bidding manners do not yield the same actual prices as shown with experiments by Isaac *et al.* (2005) who recommend auctioneers to allow bidders to place jump bids or to make a careful choice of the bid increment. He and Popkowski Leszczyc (2013) who conducted two studies in a real-world setting find a positive correlation between jump bidding and ending prices.

Second, the auction host is in relation with both the seller and the buyer and get paid by both of them. Indeed, auction hosts earn revenues by charging commissions on buyers and sellers, *i.e.* a certain percentage of the price realized at auction. Ginsburgh *et al.* (2010) show that changing the levels of buyer's and seller's commission rates matters for the outcome. They find that when increasing both seller and buyer commission rates, the seller is worse off when buyers can be better off. This is due to the correlation between the level of commissions, the seller's reserve price and buyers' participation.

When considering the seller side only, on the art and antiques market, this commission rate is subject to a negotiation between the auction house and the seller, as auction houses compete on the seller's side to obtain the best items for sale. But on the Internet auctions market, the seller's fees and commissions are not negotiable and online auction companies are free to determine their levels. Sellers have to pay a fixed fee to list their item (no matter if it is finally sold), and if the auction successfully concludes, sellers must pay a commission rate charged by the online auction platform. Yao and Mela (2008) argue that in general, revenues increase with higher fees (a uniform pricing strategy) and lower commissions (a form of high-value price discrimination). Indeed, they explain that as fees rise, seller's profits decrease which dissuade sellers to list items. Bidders encounter less auction sales so they bid on fewer goods but increase their bids to win. When proceeding to commission reductions, the auction house attracts high-value sellers, because their profit per item increases, which results in higher gross volume sold that compensates revenue losses due to commission reduction for the auctioning agent. A close practise used by auction houses is to apply buy-in penalties, that is a fixed amount defined in advance that the seller must pay to the auction firm when the item does not get sold. Greenleaf and Sinha (1996) find that these penalties combined with lower commissions is a Pareto-dominant strategy

compared to the strategy of higher commissions without buy-in penalties. Indeed, a lower commission and a buy-in penalty motivate sellers to set lower reserve prices, which increase expected total auction revenues.

Linked to the seller's reserve price, another mean on which auction houses have influence are pre-sale price estimates publicly given by auction houses. Pre-sale estimates generally include a low and a high price estimate of the item which will be presented at auction. These pre-sale estimates stem from a compromise between the seller and the auction house. Indeed, as the seller's reserve price cannot be above the low price estimate, the seller tends to push the estimation upward to ensure the highest minimal price. As for auction houses, they aim at shifting price estimates downward in order to attract buyers, while they have to satisfy the seller with a sufficient price (Louargand and McDaniel 1991). A great number of research has focused on pre-sale estimates and their accuracy to predict actual prices. Ashenfelter (1989) first finds that pre-auction estimates predict well the obtained prices, corroborating Milgrom and Weber (1982)'s model that "*honesty if the best policy*". However, most empirical studies show consistent biases in pre-sale estimates. For example, Beggs and Graddy (1997) observe that recently executed contemporary art is systematically overvalued, while longer and wider paintings are undervalued. Mei and Moses (2005) find that pre-sale price estimates of expensive paintings are subject to a consistent upward bias over a long period of 30 years. They suggest that this result can be explained by art dealers or auction houses advising their clients to buy the most expensive artworks they can afford (*i.e.* with the highest estimated prices), presuming that "masterpieces" outperform the market. Indeed, as auction houses are paid by the seller's commission and the buyer's premium based on the realized price, the higher the price, the higher the auction house's overall returns. Art buyers are influenced by pre-sale price estimates when they think about the maximum price they want to pay for artworks and are likely to pay more for an artwork with a high price estimate. Ekelund *et al.* (2013), who control for selection bias, find that price estimates of early twentieth-century American artists over 20 years are biased downward and underestimates become greater with the value of the artwork. Their explanations are twofold. Firstly, if estimates are lower, more buyers are attracted and the auction house has more chance to maximise its revenues by selling more as seller's reserves are lower. Secondly, sellers experience a satisfying surprise if they receive a price that exceeds the expected price based on estimates and are consequently more likely to offer further items for sale to the auction host, which in turn should result in increased sales and profit levels for the auctioning agent (Palmatier *et al.* 2008).

Another tool that is sometimes used by auction houses in order to attract sellers is price guarantees. In a guaranteed auction, the auction house guarantees the seller a minimum price whatever the sale outcome. If the highest bid does not exceed the seller's reserve price, the auction house pays the guarantee to the seller and become the owner of the good. If bids exceed the seller's reserve price, the auction house gets a higher commission (*i.e.* in addition to the regular seller commission) on the share above the guaranteed price. The guarantee amount and commission are the result of a negotiation between the seller and the auction house. The main result of Greenleaf *et al.* (1993) is that price

guarantees increase expected revenues for sellers but lower the expected payoff for the auction house compared to traditional auction, however they allow the auction house to retain the seller's business. Greenleaf *et al.* (2002) explain this result as the consequence of the seller's capacity to negotiate guarantees and commissions, not as the consequence of the guarantee *per se*.

We now turn our attention to the buyer side to examine buyer's premium. Buyer's commission is not subject to bargain and auction houses can take advantage of their power on buyer's premium. This buyer's premium is part of a partitioned pricing strategy (*i.e.* dividing a product price into two or more mandatory parts). Indeed, buyer's premia can increase auction prices as many bidders do not completely or accurately process partitioned prices (Morwitz *et al.* 1998).

It can finally be noted that there are differences in terms of auction outcomes depending on the auction host *per se*. There is evidence that prices paid by buyers are systematically higher at certain auction houses and locations because of their attractiveness (see for example Renneboog and Spaenjers 2013 in art market auctions, Ong *et al.* 2005 in real estate auctions).

Third, once the rules of auction sales set down by the auction host, all pre-sale activities, *i.e.* the concrete and daily work of the auctioning agent and auctioneer, remain. This is the main focus of our research. It is an important but surprisingly little investigated mean left at the disposal of auction houses and auctioneers. This paper empirically explores some pre-auction organizational and promotional tools of auction houses and tools of auctioneers when conducting the auction sale. We examine both how the pre-sale work by auction houses and the auctioneer's behavior affect auction outcomes, that is the sale probability, the final auction price and the price differential between the average pre-sale estimate and the final purchase price.

Before the sale, auction houses perform behind the scenes an organizational work as well as a promotional work. Organizational work refers to the auction host decision-making on various modalities regarding the organization of the sale, such as the choice of when the sale takes place, which and how much of the items are presented for the sale, how lots are constituted, or how they are ordered. Promotional actions can be defined as the different ways lots for sale are advertised, presented and praised, for instance with a glowing comment or an in-depth description. Some variables related to the sale organization and to the promotional work of auctions houses have been explored previously. For example, with respect to the organizational work, organizing auction sales some months of the year allows relatively lower or higher auction prices (Agnello and Pierce 1996; Renneboog and Spaenjers 2013; Worthington and Higgs 2006), but does not seem to influence the probability for an item of being sold (Marinelli and Palomba 2011). Then, Beggs and Graddy (1997), corroborated later by Campos and Barbosa (2008), show that the order of sale has an impact on prices. Indeed, when organizing auctions of heterogeneous items, the auction house must deliberately make a decision about the order in which the items will be auctioned. The two authors show empirically and theoretically that the realized price at auction relative to the pre-sale estimate declines throughout the auction and that auction houses'

optimal strategy is to order heterogeneous items by declining estimated values. However, Picci and Scorcu (2003) do not find this order of sale effect once employing a dynamic model, while experts in the organization of auction sales declare mixing items to kick excitement off and maintain it over the course of the auction sale. Regarding the promotional work of the auction house, Agnello and Pierce (1996) and D'Souza and Prentice (2002) find that higher value is placed on artworks when an illustration of the artwork for sale is provided in the pre-sale catalog in addition to information about the item. Yao and Mela (2008) calculate, using six months of Internet auction data for Celtic coins, that the presence of a picture increases item average valuation by \$0.54. Moreover, Euwe and Oosterlinck (2017), Cinefra *et al.* (2019) show that a greater length of the lot description, that conveys importance to the item and provides information, command higher prices, *ceteris paribus*. It is undeniable that these marketing efforts require time, energy and therefore increase costs for the auctioning agent so we hypothesize that organizational features affect auction outcomes and that promotional work increase prices. In summary,

H1: Organizational efforts have an impact on the probability of sale and final auction prices.

H2: Promotional efforts increase the likelihood for an item of being sold and fetching a high price.

Over the course of the auction, the auctioneer is in charge of conducting the sale and can contribute to the sale in a variety of ways. The professional auctioneer is free to get more or less involved in the process of the auction and is able to use different strategies in delivering comments or information. The performance of auctioneers have been addressed by socio-linguistic studies that examined the characteristics of their talks (Kuiper 1992; Kuiper and Haggo 1984; Kuiper and Tillis 1986) and other studies have analyzed the social interaction between the auctioneer and bidders (Heath and Luff 2007a), the characteristics of auctioneer's gesture and other forms of bodily conduct (Heath and Luff 2007b) or the implications of the strike of a hammer to conclude a contract (Heath and Luff 2013).

This paper aims at exploring the link between the auctioneer's actions throughout on-site outcry auction sales and the auction outcomes. The question we investigate is whether the auctioneer's role on stage is market neutral or if this party rather influences the auction outcomes and how, i.e. by which intervention type, which have not been captured yet in other studies. On the one hand, in a competitive bidding system with bidders highly informed about the items for sale, a significant economic impact of auctioneers may appear unlikely.

On the other hand, auctioneer Hugh Edmeades asserts that auctioneer's performance during the auction is determining. Lacetera *et al.* (2016) confirms this conjecture by measuring a performance variability across auctioneers. They find that auctioneers vary systematically in their effects on auction outcomes (probability of sale and two different price metrics) for otherwise similar cars. The market they study gathers participants who are experienced professionals. They also observe that faster auctioneers tend to achieve better auction outcomes. Without proceeding to a quantitative analysis of the sources of these differences, i.e. the tactics employed by auctioneers on stage, they suggest that this

heterogeneity stems from disparity in their ability to generate bidder excitement and urgency. Indeed, auction sales are emotionally-charged environments that may give rise to behavioral bias such as auction fever (Häubl and Popkowski Leszczyc 2004; Jones 2011; Malmendier and Szeidl 2020; Ockenfels *et al.* 2006). Auction fever is the “*increased emotionality state that is experienced by bidders*” (Adam *et al.* 2011, p. 205). This emotional state results from a high level of arousal (Ku *et al.* 2005), increased excitement (Lee *et al.* 2009) and desire to win (Malhotra *et al.* 2008). When some bidders get caught up in auction fever, “*their emotions block their ability to think clearly*” (Murnighan 2002, p. 63) and bidders end up overbidding, *i.e.* calling for prices beyond their initial limit (Adam *et al.* 2015; Ku *et al.* 2005; Malhotra 2010; Murnighan 2002). Time pressure, a typical component of auctions generated by the looming deadline, appears to induce increased bidders’ arousal that leads individuals to bid above their pre-set valuation, even for experienced bidders (Adam *et al.* 2015; Ku *et al.* 2005; Malhotra 2010).

Chipty *et al.* (2015) describe the oral outcry auction as “a race against the clock”, explaining that auctioneers face a time-revenue dilemma. Bidder attendance varies over time as bidders are commonly only interested in a few items presented for sale, not all of them, so that most of the time bidders spend in an auction is usually considered as lost. At the same time, a higher number of bidders is correlated with higher revenue (Bajari and Hortacısu 2003; Brannman *et al.* 1987; Ching and Fu 2003) and higher sale probability (Ong *et al.* 2005). As the time between bids lengthens as the bid nears the final price (Chipty *et al.* 2015), the auctioneer is thus confronted with a tradeoff between continuing the bidding process on a lot despite the slowdown to maximise revenues on this lot, and closing bidding (even though a higher bid was possible) to allocate time to other lots, whose sale and price might be jeopardized.

What is more, in the context of online auctions, Ducarroz *et al.* (2016) show that in-process promotions sent by an auctioning platform have a positive effect on final auction price, confirming that bidders’ valuations are impacted by the market environment in online auctions (Chan *et al.* 2007). In line with these studies, we speculate that auctioneer’s interventions may improve auction outcomes. Thus,

H3: *The various contributions of the professional auctioneer during the sale are not neutral regarding the propensity for the item to be sold and/or to reach a high price.*

3. Data and methodology

This section first details the sample (3.1.) and how we collect our data (3.2.). Then, we introduce the variables and descriptive statistics (3.3.). We finish by presenting the model (3.4.).

3.1. The sample

The dataset includes 1101 artworks auctioned between March 2017 and May 2018 by seven different auctioneers in six different auction houses. There is usually one auctioneer per auction sale, but for one Christie's sale (June 2017), two auctioneers have succeeded one another. As there are many types and styles of artworks on the global art market, acknowledged as extreme case of heterogeneous goods, we reduce this variability by considering only one relatively homogeneous art submarket. We include sold and unsold lots in order to avoid any selection bias (Alford *et al.* 2017). Our focus is on the European comic art market, i.e. our observed lots are original comics auctioned in Paris and Brussels. The comic art market is a young and expanding art market which has almost never been studied. We work with cross-sectional data over a one-year period, in order to have the most exhaustive data on this year and the most recent one. It should also be noted that since the comic art market is young, the completeness, the number and the reliability of the information provided by the auction houses have been increasing with the recent years. All main auction houses which regularly organize original comic dedicated sales are represented, apart from Vermot et Associés, since they did not provide all artwork images. The distribution of the sampled lots between the different auction houses follows: Christie's (30.2%), Coutau-Bégarie (14.4%), Cornette de Saint Cyr (18.5%), Artcurial (17.1%), Huberty-Breyne (10%), and Millon (9.8%).

Our dataset focuses on one type of auction format: English ascending auctions. Indeed, the ascending auction system is the type of auctions in which auctioneer's strategies have the most potential to affect the sale, according to Cassady (1967). Thus, our data are drawn from ascending auctions in order to explore whether auctioneer's tactics influence outcomes. The ascending English auction is a popular type of auctions in which the auctioneer opens the auction by announcing a starting price and bidders submit increasingly higher bids until one bidder remains, who buys the item at the price of the highest bid (and to which fees are added). This auction format is also characterized as an open auction mechanism: as the competition between bidders is opened, each bidder discovers the bids submitted by others and therefore get information about their valuations.

3.2. Data collection

We compile this unique dataset by collecting by hand all information about pre-sale organizational and promotional work by auction houses, auctioneers' oral interventions during the sale, final purchase prices, and items' characteristics to control for heterogeneity between art pieces.

Our main source of information lies in pre-sale catalogs, as published by auction houses. In most art auctions, auction houses provide catalogs to their customers before the sale takes place. Catalogs do not only gather a list of items for sale with their corresponding price estimates: they are also classy hardcover books with high gloss paper that present the artworks for sale, with more or less detailed

information (title, artist/school, date, medium, etc.) and sometimes a picture. For one variable related to the organization of the sale, which measures the degree of competition with other similar sales, we screened the websites of French and Belgian auction houses.

All sampled auction houses allow live bids through online platforms. It is therefore possible to follow auction sales through live video display. We recorded the videos of the sales selected in our sample³ in order to construct variables related to the auctioneers' oral interventions over the course of the auction sale. All sampled sales were transmitted live on the Drouot Live platform, except for the Christie's and Artcurial sales which were transmitted live on their respective live platforms.

This broader approach allows to capture the impact of several aspects of organizational and promotional work of auction houses and auctioneer's strategies on sales and prices, that have received little attention in the literature so far.

3.3. The variables and descriptive statistics

Descriptive statistics are reported in Table 1. Our dependent variables are threefold: the probability of sale (for which a dummy variable is created and equals 1 if the item is sold, 0 otherwise), the (log) price buyer's premium included and the price-estimate ratio (the hammer price relative to the average pre-sale estimate). In our sample, there are on average 28% of unsold lots per sale, while the average unsold rate of the global art market is 34% in 2017 (Artprice Annual Report, 2017). We choose the price buyer's premium included rather than the hammer price, since it is the price buyers are willing to pay to acquire. The average price (buyer's premium included) for a comic artwork is 7 633 € but the median is much lower (1 877 €) which shows disparity among artwork prices. One square centimeter of artwork costs on average almost 7 €, while for 50% of our sample, the square centimeter of artwork costs less than 1.47 €. Regarding the hammer price in percentage of the mean estimate, the ratio is on average over 1, which means that the sum of artwork prices in our sample exceeds all mean estimates aggregated. But less than 50% of artwork hammer prices beat the mean estimate, since the median ratio is 0.94.

In order to test our research questions empirically, we construct three groups of explanatory variables, regarding i) the sale organization ii) the presentation of lots in the catalog iii) the auctioneer's behavior. In addition, we include typical variables of control related to artworks' characteristics (such as the artist's reputation, the size, the signature, the medium and the topic, see Appendix A for these variables and their definitions).

The organization of an auction sale includes several aspects that constitute as many steps of decision-making by the auction house. We identify seven of them. The auction house has first to choose

³ We use the software *ActivePresenter*© to record these videos.

a date. It may decide to stick with other auction houses' calendar, so that it benefits from a customer attraction effect due to concentration of similar sales at the same time. But it may also decide to escape competition by scheduling a time with less similar sales. Our variable *Other sales* captures the number of similar sales (*i.e.* auction sales dedicated to original comics) 15 days before and after the sale. Half of our sampled sales are organized close in time with at least another competing sale. Then, the choice concerns the *sale size*: auction houses can decide to make large sales (with several hundreds of lots) or smaller sales (one or two hundred lots). On average, our sampled sales include 217 lots. Smaller sales are often more prestigious sales, with a set of carefully selected artworks, so that we can expect lots of smaller sales to reach higher prices on average. Next, the auction house has to order its lots for sale, and as seen in the literature review, the *lot order* can have an effect on auction outcomes.

When receiving items from sellers, auction houses can get several works from the same artist. From that point, is it a better strategy to sell several works from the same author in the same sale or to spread them over the coming sales? On the one hand, presenting many works from the same author can attract more buyers collecting this artist, and the higher the number of bidders, the higher the price. On the other hand, one can expect that presenting several works from the same artist gives more opportunities to buy one of them, so buyers will fight less as supply is greater. To understand which effect prevails, we add the variable *number lots author* that measures the number of lots from the same author per sale. Half of our lots are accompanied by one or more other works from the same artist. The average number of lots from the same artist presented for sale is high (4.38), because two out of the seven sales recorded began with a part dedicated to one artist (a few tens of lots). When several works from an artist are presented in one sale, it is interesting to analyze if the order of sale among these works from the same author matters. Do bidders especially fight on the first lot(s) from the artist for sale to ensure that they will make at least one purchase by fear of losing the opportunity? Or do bidders start to bid slowly for the first lot(s) presented for sale while becoming more aggressive (*i.e.* bidding more) on the last ones because supply decreases? To answer this question, we include a variable *subrank author* that indicates the rank of the lot out of the lots from the same author. For example, when this variable is equal to 4, it means that there had been three other artworks from the same artist that have been presented for sale previously.

Also, works (from the same author or not) can be sold together or separately. Is a lot including multiple items more likely to sell better or at a higher price? One argument is that gathering artworks in one lot may dissuade buyers to buy them because they could be interested only in one of the items, so they do not want to pay for the other items included in the lot. As the auction house is free to sell only single items, a counter-argument is that these multiple lots have been thoughtfully conceived by the auction house in order to keep items that have common artistic attributes together which would therefore sell better or achieve higher prices than if sold separately. We create the dummy variable *multiple items lot* that equals 1 if the lot consists of more than one item (6% of our sample), 0 otherwise. In addition, several lots come with a top-up attached to the main work such as a drawing on the reverse side or on a

separate sheet, a coloring (a colored separate material), an original edition of the album from which the work is issued or a letter from the artist. The top-up may have a positive effect on auction outcomes because it adds slightly more value to the lot compared to other lots without. The created dummy variable *lot top-up* allows us to test for this effect on sales and prices (10% of items are concerned).

Ahead of the auction sale, the auction house has three means at its disposal to praise lots and inform about their attributes. The presentation and promotion of the lots for sale is done through pre-sale catalogs. The literature has shown that adding a picture of the work for sale has a positive effect on prices, but does the size of this picture matter? And if it is given prominent place on coverpage? We measure the *illustration size* in percentage of the catalog page, so that if the illustration appears on more than one page, this percentage can be higher than 100%, and if there is no illustration this percentage equals 0%. On average, an illustration occupies 38% of the pre-sale catalog page. We expect this variable to have a positive impact on prices, as *i)* the production and printing of catalogs is costly and *ii)* as buyers have a clearer view of the lot and may think that if it is printed big or several times the work is valued.

Apart from the picture, the catalog provides a description of the lot with various information about the artist (name, date of birth/death) and the artwork (year of production, medium, signature, condition, eventually exhibition and provenance). The auction house decides occasionally to add a whole paragraph of further detailed information about the work itself, the context of production or the artist. The dummy variable *in-depth introduction* corresponds to 1 if the lot is subject to such a paragraph. This in-depth introduction applies to 29% of our sampled cases. We speculate that the additional information and the effect of differentiation compared to other lots brought by this extra paragraph to latent bidders should lead to increased probability of sale and price. Lastly, we generate a dummy variable *positive comment* for whether the lot description contains an additional comment such as “beautiful/wonderful piece”, “high/exceptional quality”, “rare piece of art” or “museum piece”, the intention of which is to emphasize the quality of the good in order to boost sale rates or prices. These positive comments are written by the art expert(s) in charge of the artwork descriptions. 45% of our sampled lots go with a positive comment, a proportion which can be considered as high, but can be justified by the youth of this art market which is certainly still in a process of legitimization.

We now turn to auctioneers’ tools to intervene in the ongoing sale. We distinguish four of them. First, the auctioneer (or the expert to whom he delegates the task) has the possibility to read the whole description of the lot which will be proposed for sale or to read only its title before bidding starts. Reading descriptions takes time and bidders have already carefully read the information about their lots of interest before auction. It also threatens to install a routine and slow down auctions. We thus speculate that descriptions reading has a negative influence on the probability of sale and prices. To test for this effect, we include the dummy variable *description reading* that takes the value of 1 if the lot description is read –in our sample in 66% of cases–, 0 otherwise. Sometimes, it happens that the auctioneer (or

expert by proxy) corrects a mistake or mentions a feature (s)he forgot to write in the description about the lot: we create an *oral correction* dummy variable that takes the value of 1 if there is a correction (2% of our sample) and 0 otherwise, to identify a potential impact (whatever the nature of such correction, in favor or not of the item for sale). We believe that this change in the given information is not neutral in the sale process. On the one hand, an oral correction may have a positive effect on prices if it enhances trust of bidders in the auctioneer's good faith and/or because it can impair decision-making under time pressure (Adam *et al.* 2011; Ku *et al.* 2005). On the other hand, an oral correction may worry the bidders that would turn away from this lot.

Next, the auctioneer may shed light on a lot by saying a positive remark about it, such as “beautiful artwork”, “unmissable opportunity” or “it's worth more”. This kind of remarks reflects the quality perceived by the auctioneer –usually not an expert–, and represents an advertising and persuasive message sent in the heat of the moment. This auctioneer's strategy aims at increasing the probability that the lot goes sold and the price. The impact of this tactic depends on the legitimacy attributed by bidders to the auctioneer's judgement. The variable *positive remark* is coded 1 if the lot is highlighted by a positive auctioneer's remark, 0 otherwise. In our sample, 19% of lots are subject to a positive statement with respect to them. Finally, we observe that auctioneers often use humor and make jokes when conducting auctions. We are not aware of any studies that have analyzed the effect of humor in real-world auctions. In the management literature, humor is “*a message whose ingenuity or verbal skill or incongruity has the power to evoke laughter*” (Lee and Kleiner 2005). It is likely that humorous notes by auctioneers have no effect on auction outcomes since they do not give any information on the artwork for sale. However, if we consider the auctioneer as a salesperson, the literature has shown that humor usage by a salesperson may result in increased customer trust (Bergeron and Vachon 2008; Lussier *et al.* 2017) which might positively contribute to auction outcomes. Other studies have shown that humor may also be detrimental to the individuals' relationship (Martin *et al.* 2013; Tremblay *et al.* 2016), so we might also expect a negative impact of auctioneer's humor on outcomes. To capture the humor effect, we add the discrete variable *humor*, which equals to 1 if the auctioneer made one or more humoristic comments (and 0 otherwise). We find that the auctioneer employed humor for 21% of our sampled lots.

We summarize all our variables with the expected sign of their impact on auction outcomes in Table 2.

3.4. The model

Our hypothesis is that auction house's and auctioneer's daily work play a role on sales, prices and the price-estimate ratio. The hedonic approach shows that price variations among heterogeneous products can be explained by differences in characteristics (Court 1939; Griliches 1971) such as, for artworks, artist-related features, artwork attributes, but also, and this is our concern, sale-related aspects.

We implement a hedonic price model considering variables related to the auction house's and auctioneer's impact, in addition to variables linked to the artist and artwork that serve as controls for heterogeneity. Our analysis consists in two regressions: we estimate model 1 that explains the (log) price buyers' premium included and model 2 in which the observed variable is the (log) hammer price in percentage of the average pre-sale estimated price. Pre-sale estimates are usually a price range, thus the pre-sale average estimate considered is the midpoint between the low and high estimates. While model 1 fits into traditional hedonic pricing models, model 2 is an original variant, that aims at understanding if auction houses and auctioneers increase the propensity of some items to perform surprisingly well.

Besides, some items do not sell during auction sales, as no bid exceeds the reserve price. Hedonic pricing models in art market studies commonly exclude unsold items but result in biased coefficients (Alford *et al.* 2017). Our sample includes all lots, sold (72%) or not (28%). Tobit models are designed for censored dependent variables, allowing to include all sampled observations, below and above the threshold (in our case the seller's reserve price). We apply Type II Tobit models, which are equivalent to Heckman selectivity models, as the latent variable does not assimilate to the observed dependent variable. Formally, our model is:

$$y_{2,i} = \begin{cases} y_{2,i}^* & \text{if } y_{1,i}^* > 0 \\ 0 & \text{if } y_{1,i}^* \leq 0 \end{cases} \quad (1)$$

$$y_{1,i}^* = o_{1,i}\beta_1 + p_{1,i}\gamma_1 + a_{1,i}\alpha_1 + w_{1,i}\omega_1 + \varepsilon_{1,i} \quad (2)$$

$$y_{2,i}^* = o_{2,i}\beta_2 + p_{2,i}\gamma_2 + a_{2,i}\alpha_2 + w_{2,i}\omega_2 + \varepsilon_{2,i} \quad (3)$$

where $i = 1, \dots, N$ denote each lot with N the sample size, $o_{j,i} = (o_{j,i}^1 \dots o_{j,i}^{K_j})$, $j = 1, 2$, are two vectors of observed organizational characteristics of the auctioned lot, $p_{j,i} = (p_{j,i}^1 \dots p_{j,i}^{L_j})$, $j = 1, 2$, are two vectors of observed promotional characteristics to which the lot is subject, $a_{j,i} = (a_{j,i}^1 \dots a_{j,i}^{M_j})$, $j = 1, 2$, are two vectors of observed characteristics related to auctioneer's interventions during the sale of the lot, $w_{j,i} = (w_{j,i}^1 \dots w_{j,i}^{N_j})$, $j = 1, 2$, are two vectors of observed artwork characteristics (control variables), $\beta_j = (\beta_{j,1} \dots \beta_{j,K_j}) \in \mathbb{R}^{K_j}$, $j = 1, 2$; $\gamma_j = (\gamma_{j,1} \dots \gamma_{j,L_j}) \in \mathbb{R}^{L_j}$, $j = 1, 2$; $\alpha_j = (\alpha_{j,1} \dots \alpha_{j,M_j}) \in \mathbb{R}^{M_j}$, $j = 1, 2$; $\omega_j = (\omega_{j,1} \dots \omega_{j,N_j}) \in \mathbb{R}^{N_j}$, $j = 1, 2$, are eight vectors of unknown coefficients. The random disturbances $\varepsilon_{j,i}$ are normally distributed with zero mean and constant variance, σ_j^2 ($j = 1, 2$). $y_{1,i}^*$ is the latent variable which is the difference between the last bid and the seller's reserve price. If it is positive, it means that the last bid reaches the seller's reserve price, so the lot is sold, if not the latent variable is negative and the lot remains unsold. It is not possible to observe the value of the latent variable $y_{1,i}^*$ but only if it is above or below zero. $y_{2,i}$ is the observed dependent variable, a price metric. In Model 1, the price metric is the logged auction price (buyer's premium

included) and in Model 2, the price metric is the logged hammer price in percentage of average estimate. The variables $o_{j,i}$, $p_{j,i}$, $a_{j,i}$ and $w_{j,i}$ are observed for each item, no matter if it is sold or not. Equations (2) and (3) are usually referred to as the selection equation and response equation respectively.

4. Results

This section presents our results and analyzes the influence of the auction house and the auctioneer on the probability of sale and on prices (Model 1) (4.1.) and on the price-estimate ratio (Model 2) (4.2.).

4.1. Impact of auction house and auctioneer on probability of sale and prices

Table 3 reports the results of Model 1 on the impact of auction houses and auctioneers on the probability of sale (Equation 1) and on the price (Equation 2). Table B contains the regression statistics (Appendix B). The sample size reduction is explained by one missing item size. Overall, our estimates do not suffer from multicollinearity problems, as no variance inflation score (VIF) exceeds 3.67 and the mean VIF-score is 1.53.

The results of Model 1 show at first glance that some organizational, promotional and auctioneer effects play a role in explaining the probability of sale and the price, which supports H1, H2 and H3, although all variables do not have a significant impact. The following sections describe and analyze the influence of the auction house organizational work (4.1.1.) and promotional work (4.2.2.) as well as of the auctioneer's interventions (4.3.3.) on auction outcomes (probability of sale and price).

4.1.1. Organization of an auction sale

The number of competing sales close in time to the date chosen by the auction house for its sale is negatively associated with the outcome of artwork transactions, while not being correlated with prices. This result suggests that buyers indulge in being more stringent about their requirements when they are being offered a broader supply. Consequently, avoiding competition is a better strategy for auction houses than trying to benefit from a bidders' attraction effect brought by other similar sales.

However, concentrating lots of the same author in the same auction sale commands a higher sales' rate and premiums, a finding for which two explanations may be submitted. Firstly, this auction house's strategy aims at attracting individuals collecting the artist, *i.e.* increasing the number of bidders. As shown by Bajari and Hortaçsu (2003), Brannman *et al.* (1987) and Ching and Fu (2003) among others, the number of bidders positively contributes to prices and, according to Ong *et al.* (2005), to the probability of sale. We note that, on the comic art market, artworks of a particular artist can be nearly absent from the market for a while, as a result of the will of the artist or the dead artist's family, or of a deliberate strategy of galleries and auction houses. Then, an auction sale including many works of the artist appears in this context as particularly attractive for collectors interested in this artist's work.

Secondly, a phenomenon of auction fever, also called “competitive arousal” or “bidding frenzy” (Häubl and Popkowski Leszczyc 2004; Jones 2011; Malmendier and Szeidl 2020; Ockenfels *et al.* 2006) may be at stake, which results in overbidding. Auction fever comes from a heightened arousal, due to social facilitation, rivalry, time pressure and desire to win, among others. Social facilitation is characterized by Guerin (1986) as “*the effects on behavior caused by the presence of other persons*”. The tactic employed by the auction house here produces an auction setting that gathers many experts and amateurs of the artist’s work. According to Zajonc (1965), the presence of an audience of coactors increases arousal and Henchy and Glass (1968) add that arousal is higher in presence of an audience with expertise. Moreover, Platanina and Moran (2001), Zajonc and Sales (1966), find that the presence of an audience leads to emission of dominant responses rather than subordinate ones.

Concerning the subrank among items from the same artist for sale, we observe a significant and negative effect upon prices. This finding suggests that bidders do not hide their intentions in the hope of making better deals at the last lots of the artist, hence they do not hand the floor over to others before entering the game. Rather, bidders compete and focus on the first lots from the artist presented for sale in order to be assured of at least one purchase, so that when each eager bidder is satisfied, less bids are submitted and prices logically decrease. This result can also be seen in the light of the declining price anomaly. Beggs and Graddy (1997) explained the price decline throughout the sale by the fact that buyers are quickly satiated by artworks because they are either dealers buying for particular client or private buyers with finite wall space or constrained resource. Viewing the set of artworks from the same author as one sale for which buyers interested in this author especially come, our finding can be understood as the consequence of this satiety effect.

Multiple items lots achieve, on average, lower prices than single item lots. We develop two possible explanations for this result. One reason is that bidders can be frustrated to be obliged to buy the whole lot when there are mainly interested in one piece of the multiple lot, which could lead to fewer bids. Another possible explanation, for example in the case of two boards from the same comic book sold together, is that the marginal utility for buyers of acquiring pieces of art from this artist and this comic book decreases, so that the acquisition of the first artwork of this type is worth more than the acquisition of the second one, and the second one more than the third one and so forth. This declining marginal utility leads to prices below those that would have been achieved if the lot was split. One last reason for this result is that artworks sold in a set are often artworks of a lower quality than those sold individually. The sale of a multiple items lot can be interpreted as a signal of inferior quality.

On the contrary, lots with a top-up have a higher probability of sale vis-à-vis lots without any pop-up. The extra element allows these lots to distinguish themselves from others, making them appearing as singular, which brings people not to miss the opportunity of purchasing them. Thus, it is worth mentioning this top-up in the catalog and not separating them from the item for sale.

Lastly, our results suggest that as the sale progresses, items are less likely to sell, *i.e.* bids are less likely to reach the seller's reserve price. We also find that the size of the sale do not seem to play a relevant role in outcomes.

4.1.2. Promotional work before an auction sale

With regard to the presentation of lots by pre-sale catalogs, it appears that all three variables affect very significantly (at the 1% level) and positively the price. We learn that, not merely does the presence of an illustration of the item in the catalog matters (Agnello and Pierce 1996; D'Souza and Prentice 2002; Yao and Mela 2008), but their size also plays a role in determining auction prices.

Our results show that including an additional more detailed paragraph of information produces a positive effect on artworks prices. Three reasons can be involved. As mentioned by Cinefra *et al.* (2019), the first rationale lies in the manifest importance given to the lot by the auction house. Second, the art market, especially for contemporary art – and the comic art is one of them –, suffers from asymmetries of information and uncertainty about the product quality, as neither the production costs nor some objective functions of these objects provide signals of quality, contrary to manufactured goods (Beckert and Rössel 2013; Coffman 1991; Frey and Eichenberg 1995). Descriptions of lots in pre-sale catalogs are written by experts, entrusted by the auction house, who examine the lots for sale and do research into these lots. Thus, lots presented for sale with ample information are more likely to be highly valued by the market, as these additional information released by a recognized actor of the market reduces information asymmetries and increase buyer's confidence. Third, it has been argued that art appreciation requires knowledge (Bourdieu and Darbel 1991), so that this added paragraph might provide a further knowledge valued by art consumers.

Next, we observe that positive comments printed in pre-sale catalogs play a relevant role in determining the probability of sale and prices. As well, this finding can be explained by the highlighted importance of this lot and by the reduction of quality uncertainty brought by the expert's advantageous comment. A last interpretation is linked to one of the three main motivations of art buyers: the social visibility. Indeed, buying art can be a mean for consumers to stand out from the crowd ("snob effect"), to stress their wealth ("Veblen effect") and to look for peer recognition ("bandwagon effect") (Leibenstein 1950). It is possible that buyers looking for social distinction may have a higher willingness-to-pay for goods that are publicly described as being particularly "good" art.

4.1.3. The auctioneer's oral interventions

Focusing upon the auctioneer effect now, one striking result is that auctioneer's touch of humor in auctions turns out to be a highly significant and important determinant of both the sale probability and the price. Many explanations can be drawn from the literature.

Firstly, as highlighted by Duncan (1982), Teng Fatt (2002) and Vuorela (2005), one of the substantial benefit of humor is to diffuse tension, but also anger and frustration (Lee and Kleiner 2005). In the context of auctions that can be stressful, irritating and strenuous for bidders, humor participates to diminish anxiety and hostility and create a more relaxed and serene atmosphere.

Secondly, humor usage by salespeople results in increased customer trust (Bergeron and Vachon 2008; Lussier *et al.* 2017) through different mechanisms. Indeed, a salesperson's appropriate sense of humor shows that (s)he has sufficient confidence to tell something funny in a stressful situation, sending a reassuring signal of being in control (Avolio *et al.* 1999). Then, the use of humor demonstrates humanity which is one of the dimension of trust (Doney and Cannon 1997), allowing the auctioneer to speak to the bidders of the audience on their own level. Additionally, a sense of humor increases liking for the source (Bryant *et al.* 1980; Hawke and Heffernan 2006) which, by ultimately improving the relationship, is likely to help improving customer trust. As Bauer (1960) claims "*any action of a consumer will produce consequences which he cannot anticipate with anything approximating certainty, and some of which at least are likely to be unpleasant*", consumers perceive risk inherent to each of their transactions, that is why trust is important to reduce their perceived risk. Trust is also critically important in a market as uncertain as the art market regarding quality, value and authenticity of the goods traded.

Thirdly, another explanation of our finding is that humor has an attention-attracting quality, it distracts the audience and prevents from a routine (Powell and Andresen 1985; Speck 1987; Sternthal and Craig 1973; Weinberger and Campbell 1991) so that bidders are less likely to disconnect from the ongoing auction but instead keep bidding.

Surprisingly, the outcome of sale is heavily influenced by description reading by the auctioneer. One would think that reading these normally already assimilated descriptions is a useless and costly waste of valuable time, in line with the time-revenue dilemma (Chipty *et al.* 2015). Description reading gives prominence to the lot and acts as a second signal that confirms what is written in the catalog. But it may also happen that reminding lot description tempts some bidders attending the sale to join auction bidding for lots they did not intend to initially bid for, which results in a higher number of bidders. If this conjecture holds, it would be consistent with the finding of Ong *et al.* (2005): the number of bidders explains the probability of a successful sale outcome.

As for auctioneer's oral corrections, they produce a significant and positive effect on the probability of going sold/unsold. One reason of this result is that some bidders may have noticed or have doubts about an information given by the auction house in the catalog so that correction reassures bidders about the transparency and seriousness of the expertise which enhances trust in the auctioneer. Another reason is that because this new or changed information is given in the process of the auction, bidders should take quick decision about revising upward or not their pre-sale valuations. This time constraint imposed by the auction process might impair their valuation of the new information and results in more bidding above the seller's reserve price.

Finally, positive remarks from the auctioneer over the course of the auction do not contribute to any outcomes, in contrast to positive comments written in the catalog by auction house experts (as already highlighted in 4.1.2.). It seems that the auctioneer is not considered as an expert by bidders but rather as a salesperson. Bidders may doubt the legitimacy of the auctioneer to give unbiased comments about artworks.

We can conclude that both *i)* information-based factors, *i.e.* organizational and promotional characteristics of the sale known ahead of the auction sale, and *ii)* noninformation-based factors, *i.e.* behavioral factors induced by the auctioneer in the course of the auction, play a relevant role in determining outcomes of artwork transactions and auction prices.

4.2. Impact of auction house and auctioneer on price-estimate ratio

Table 4 reports results of Model 2 about the impact of auction house and auctioneer on the price differential between the hammer price and the average pre-auction estimated price (Equation 2), taking into account the possibility that an artwork might go unsold (Equation 1). Table B contains the regression statistics (Appendix B). As for Model 1, the sample size reduction is due to one missing item size and multicollinearity is not a problem.

With Model 2, we investigate the mechanisms used by auction houses and auctioneers that are systematically able to influence the hammer price in percentage of the average pre-sale estimated price. This ratio measures the spread between the value attributed by the expert of the auction house and the seller (when negotiating and fixing the estimates) and the value attributed by the bidders (the final bid results from the series of bids). When positive, this spread is a pleasant surprise for sellers whose works of art sell over the mid-estimate. This positive discrepancy appears as an added value of the auction channel for sellers, compared to sales in galleries. Naturally, the higher this spread is, the greatest the seller's surprise and satisfaction become. Consequently, sellers become more likely to use the auction house's services again, which in turn should result in increased sales and profits level for the auction house (Ekelund *et al.* 2013). Moreover, the auction house has an interest of getting the highest possible prices since the buyer's premium and the seller's commission are proportional to the hammer price.

The two following sections distinguish between the impact of organizational and promotional work (4.2.1.) and of the auctioneer (4.2.2.) on the price-estimate ratio.

4.2.1. Organizational and promotional work by auction house

Estimations show that there are less significant organization and presentation effects on this "surprise ratio" than on prices. With respect to sale organization, lots accompanied by top-ups are more valued by bidders than sellers and auction houses, therefore producing a higher price-estimate differential than lots without top-ups. Moreover, our results provide corroboratory evidence of the

declining price anomaly (Beggs and Graddy 1997) as our price relative to the average estimate decreases throughout the auction. We also find that sale size has a positive effect on the auction price relative to the pre-sale estimate. In other words, bigger sales with a lot of items to sell are more likely to generate price surprises than smaller sales. This can be explained by the fact that smaller sales are often more prestigious sales (in our sample, Christie's sales are smaller than other sales but include relatively more high-end items), so that estimates for these lots are already relatively high. Higher estimates logically reduce the likelihood for the final price to stray from the mean estimated price.

Regarding pre-sale promotional effects on the “surprise ratio”, the only factor that plays a relevant and significant role is the written positive comment. This finding shows that bidders are particularly sensitive and receptive to positive comments from experts coming with item descriptions. Auction houses' experts are considered by bidders as credible when they deliver signals that aim at reducing quality uncertainty. If the social recognition motive is at stake when bidding for art acknowledged for their quality by an expert positive comment, then our result shows that this motivation leads bidders to bid above the mean estimated price.

4.2.2. Auctioneer's behavior

But the most striking result of this second model is undoubtedly the clear and highly significant impact of the auctioneer's behavior on this “surprise ratio”. Contrary to pre-sale information, that can be anticipated a long time ahead of sale, auctioneer's interventions occur only over the course of the auction. The auctioneer is therefore better able to handle and create surprises.

Firstly, the surprise ratio appears to be higher when the auctioneer takes the time to read the description of the lot, giving some importance to the lot. One interpretation is that reminding lot information might encourage some additional bidders to join the auction, even if they did not intend to at the beginning, thus pushing the number of bidders up. As shown by Bajari and Hortaçsu (2003), Brannman *et al.* (1987), Ching and Fu (2003), the number of bidders has a significant positive effect on prices. Another interpretation is that the auctioneer may heighten bidders' excitement and eagerness through a pending effect: bidders are reminded the full characteristics of the art they desire but still have to wait before being allowed to start competing for winning the lot. This argument supports the phenomenon of auction fever (Jones 2011; Ku *et al.* 2005; Malmendier and Szeidl 2020; Ockenfels *et al.* 2006), when excitement leads to bidders' overbidding behavior (Adam *et al.* 2015; Häubl and Popkowski Leszczyc 2004; Ku *et al.* 2005; Malhotra 2010; Murnighan 2002) that fosters the “surprise ratio” outcome. Impatience in bidder's behavior has already been observed, as regard jump bidding (Isaac *et al.* 2005).

Secondly, oral corrections provided by the auctioneer have a significant and positive influence upon our price-estimate ratio. In this situation, the oral correction about the lot is provided just before starting the bidding process for this lot. Bidders have to quickly process the new piece of information

and take a decision about their valuation reassessment. Time pressure have different consequences on bidders' behavior. Adam *et al.* (2015), Ku *et al.* (2005) and Malhotra (2010) observe that time pressure can bolster bidders' arousal, while higher arousal can result in bidders placing higher bids (Adam *et al.* 2015; Ku *et al.* 2005; Malhotra 2010; Murnighan 2002). Indeed, high level of arousal induces restriction of attentional capacity (Mano 1992), higher risk-seeking (Mano 1994) and reduces time spent for deliberation and information processing (Lewinsohn and Mano 1993). Moreover, Shiv and Fedorikhin (2002) find that when the available time for the decision is low, the role of affect in decision-making is more likely to prevail over deliberative thoughts about the decision consequences. Thus, it is likely that bidders who were interested in the lot before the correction may overvalue the new information, letting themselves be dragged about by their first desire of the item acquisition. Due to time pressure, the new information tends to be overrated compared to pre-sale and anticipated information. The surprise ratio is therefore related to the time constraint affecting bidders' information processing. Also, this new piece of information provided to bidders reduces the quality uncertainty, which can be passed on to the number of bids placed and consequently to the price-estimate ratio. Finally, as explained in section 3.3., when the auctioneer provides an oral correction, (s)he demonstrates honesty and rigour qualities that foster consumer confidence, which in turn may affect the surprise ratio through more bids placed on the lot.

Thirdly, the surprise ratio tends to higher when the auctioneer exercises a sense of humor. Thus, reducing bidders' anxiety, enhancing bidders' trust and attention through humor not only positively contributes to purchase prices but also to the outcome of seller's surprise. One can also argue that the auctioneer is selling a pleasant auction sale experience to bidders and that this enjoyable dimension of the sale is integrated to the bidder's utility function. This dimension cannot be considered *ex ante* by auction houses when setting price estimates, which explains that it plays a role in determining the surprise ratio. Adopting joking behavior is therefore a successful strategy for auctioneers.

Finally, auctioneer's positive remarks through the auction process do not seem to play a relevant role in determining a higher auction price relative to the mean price estimate. One could have think that a positive remark about the lot by the auctioneer would above all give importance to the item and convince bidders about the item's quality. In fact, auctioneer's positive remarks do not affect auction prices nor the spread between the hammer price and the average estimate. This result shows that bidders lend legitimacy to the expert of the auction house who writes pre-sale information and lot descriptions, but not to the auctioneer, who is rather considered as a salesperson, in charge of providing an amusing experience. The important auctioneer's effect on the surprise ratio demonstrates that the auctioneer has a real and full role to play as a salesperson during the sale and his actions and performance produce concrete and worthy results.

5. Conclusion

Although research on auctions is prolific, consequences of a third player presence, *i.e.* an auctioning agent, have been generally underinvestigated in the respective literature. Until today, few research studies have tried to address the auction houses' day-to-day work and human auctioneer effects upon auction market outcomes (Lacetera *et al.* 2016). In the present study, we provide an original examination of the impact of auction houses' daily work and auctioneers' way of conducting auctions on sale outcomes: the probability of sale, the final purchase price and the hammer price in percentage of the pre-sale mean estimated price. This paper differs from other studies in that we link variables deriving from pre-sale catalogs as well as from interventions over the course of the auction sale with the probability of sale and price metrics. The application of a hedonic price analysis confirms the role of the auction house's organizational and promotional strategies (information-based factors) and of the auctioneer's behavior (behavioral factors) in determining outcomes of artwork transactions, prices or price-estimate ratios for otherwise equivalent art. To be specific, our empirical findings reveal that auction houses should give particular attention to the organization of the sale, as many effects exert an influence upon the probability of sale and prices, such as the level of competition with similar sales, the number of lots from the same artist, the presence of a top-up or the decision of selling lots including multiple items. We also find that the promotional work carried out by auction houses results in increases in artwork prices. The presence of a written positive comment ahead of the sale seems to be decisive: it has a highly significant and positive influence upon the probability of sale, price and the surprise ratio. Finally, we show that the professional auctioneer has a prominent impact on outcomes. Our results highlight first that the usage of humor by the auctioneer plays a relevant role in determining sale probability and auction prices, and second that the surprise ratio is mostly determined by the behavior of the auctioneer, whose role of salesman appears to be crucial in selling an entertaining auction experience in a climate of trust, rather than in bringing an expert point-of-view about the items for sale.

This research brings a more comprehensive understanding of bidders' behavior, the mechanisms through which auction houses and auctioneers affect outcomes, and the functioning of real-world auction markets. Moreover, the findings of this study yield important managerial insights for marketers. The auction house effects detected here reveal the economic significance of auction houses' strategies and provide some guidance as to the organization of auction sales and the promotion of lots, in order to maximize revenues. Successful outcomes are more likely when auction sales are not organized at the same time as other similar sales, when the lot includes a top-up and when artworks from the same artist are gathered in one sale. On the contrary, auction houses should be aware that lots from the same artist presented last tend to reach lower prices and we recommend that multiple items lot should be split in single item lots when possible. As for promotional factors, writing positive comments in pre-sale catalogs appears to be particularly relevant in order to enhance outcomes. Finally, we have shown clear evidence of the impact of the auctioneer's actions on bidders' behaviors over the course of the auction sale, which in turn affect final outcomes. Our results suggest reasons for an auctioneer to read lot descriptions before launching the lot bidding process, to use humor as a relational tool, while not to

avoid information corrections. Our study shows the importance of the auctioneer's humoristic skills in service delivery for auction houses. This observation can be used in the recruitment process of auctioneers, since having a good sense of humor increases profits for auction houses. This insight also demonstrates the usefulness of humor training programs for auctioneers. However, praising artworks during the auction does not seem to have any utility for auctioneers.

We conclude with some limitations of our study and possible future extensions. First, our data do not include individual bidders' characteristics. Such data would allow to link auction houses' and auctioneers' strategies with individual bidders' behaviors and better assess the role of bidders' heterogeneity in their responses to auction house's and auctioneer's tactics. Then, other variables related to the sale organization and the promotion of lots are worth being examined, such as the layout, the venue and the duration of the exhibitions organized by the auction house before the sale. With respect to the auctioneer's behavior, our variables concentrate on oral interventions. Exploring the impact of auctioneer's gesture and bodily conduct on auction outcomes is also a promising avenue. Furthermore, results presented in this study only focus on the European comic art market, answering to the requirement of studying a homogeneous market in order to isolate auctioning agent effects. Future research using data from other auction markets is necessary to explore auction house and auctioneer effects more broadly. Examining to what extent our results can be extended to other markets would be particularly interesting. We consider ascending (English) auctions in this paper, but other auction systems including an auctioneer are worth further empirical research.

Table 1 Descriptive statistics

Variable	N	Mean	Median	Std Dev
Price				
Hammer price (€)	793	6 090	1 500	21 731
Price buyer's premium incl. (€)	793	7 633	1 877	26 587
Hammer price in % of average estimate	793	1.17	0.94	1.02
Price per cm2	792	6.82	1.47	51.62
Organization variables				
Other sales	1 101	1.71	1	1.32
Sale size	1 101	216.59	192	79.27
Lot order (% of total number of lots)	1 101	0.53	0.55	0.28
Number lots author	1 101	4.38	2	6.22
Subrank author	1 101	2.66	1	3.61
Multiple items lot	1 101	0.06	0	0.24
Lot top-up	1 101	0.10	0	0.30
Promotion variables				
Illustration size	1 101	0.38	0.28	0.42
In-depth introduction	1 101	0.29	0	0.46
Positive comment	1 101	0.45	0	0.50
Auctioneer variables				
Description reading	1 101	0.66	1	0.47
Correction	1 101	0.02	0	0.14
Positive remark	1 101	0.19	0	0.39
Humor	1 101	0.21	0	0.41

Table 2 Summary of the expected signs for the impact of each variable on auction outcomes

Variable	Expected sign for the impact of the variable on auction outcomes
Organization variables	
Other sales	+ / -
Sale size	-
Lot order	-
Number lots author	+ / -
Subrank author	+ / -
Multiple items lot	+ / -
Lot top-up	+
Promotion variables	
Illustration size	+
In-depth introduction	+
Positive comment	+
Auctioneer variables	
Description reading	-
Oral correction	+ / -
Positive remark	+
Humor	no effect / - / +

Table 3 Tobit estimations. Dependent variable: price, buyer's commission incl. (N=1100)

Variable	Equation 1 Probability of sale	Equation 2 <i>log</i> (sale price)
Organization variables		
Other sales	-0.255 **	0.004
Sale size	0.000	0.001
Lot order (% of total number of lots)	-0.301 *	0.112
Number lots author	0.262 **	0.449 ***
Subrank author	0.003	-0.353 ***
Multiple items lot	-0.129	-0.300 **
Lot top-up	0.395 **	0.110
Promotion variables		
Illustration size	0.010	0.537 ***
In-depth introduction	0.132	1.746 ***
Positive comment	0.377 ***	0.590 ***
Auctioneer variables		
Description reading	0.320 ***	-0.145
Oral correction	0.733 *	0.169
Positive remark	0.079	-0.144
Humor	0.688 ***	0.829 ***
Control variables incl.	Yes	Yes
<i>Constant</i>	-0.175	5.034 ***

***Statistically significant at 1% level, **Statistically significant at 5% level, *Statistically significant at 10% level

Table 4 Tobit estimations. Dependent variable: hammer price in percentage of the average estimate (N=1100)

Variable	Equation 1 Probability of sale	Equation 2 log (hammer price in % of average estimate)
Organization variables		
Other sales	-0.071	-0.044
Sale size	0.000	0.000 **
Lot order (% of total number of lots)	-0.086	-0.085 **
Number lots author	0.101	0.037
Subrank author	0.005	-0.008
Multiple items lot	-0.075	-0.015
Lot top-up	0.311 **	0.072 **
Promotion variables		
Illustration size	0.044	0.023
In-depth introduction	0.109	0.016
Positive comment	0.389 ***	0.136 ***
Auctioneer variables		
Description reading	0.185 *	0.089 ***
Oral correction	0.664 **	0.195 ***
Positive remark	0.223 **	0.015
Humor	0.764 ***	0.166 ***
Control variables incl.	Yes	Yes
<i>Constant</i>	-0.396	0.214 ***

***Statistically significant at 1% level, **Statistically significant at 5% level, *Statistically significant at 10% level

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Appendices

Appendix A

To control for the heterogeneous character of artworks, we include the most commonly used hedonic variables in art market studies and we add a key characteristic of the comic art market related to the presence of the hero. Appendix A presents the control variables and their definitions.

Variable	Definition
artist's reputation	<i>Artist's reputation</i> is measured by the number of words in the artist biography found on Bédéthèque website.
artist's recognition	<i>Artist's recognition</i> is a dummy variable equaling one if the artist has been honoured by an award for her/his career (Grand Prix de la ville d'Angoulême, Will Eisner Comic Industry Awards or the Harvey Awards), 0 otherwise.
successor artist	<i>Successor artist</i> is a dummy variable equaling 1 if the work has been created by a studio or a follower artist, 0 otherwise.
living status	<i>Living status</i> is a dummy variable coded 1 if the artist is dead when the artwork is sold, 0 otherwise.
signature	<i>Signature</i> is a dummy variable which equals to 1 if the artwork is signed, 0 if not.
condition	<i>Condition</i> is a dummy variable which takes the value of 1 if the work is damaged, 0 if not.
board	<i>Board</i> is a dummy variable equaling one if the artwork is a board or a strip (which is a part of a board), 0 otherwise.
illustration	<i>Illustration</i> is a dummy variable equaling one if the artwork is an illustration, 0 otherwise.
coverpage	<i>Coverpage</i> is a dummy variable equaling one if the artwork is a coverpage, 0 otherwise.
draft	<i>Draft</i> is a dummy variable equaling one if the artwork is a draft, 0 otherwise.
coloring	<i>Coloring</i> is a dummy variable equaling one if the artwork is a coloring (the colored separate support when colors are dissociated from the drawing strokes), 0 otherwise.
ink	<i>Ink</i> is a dummy variable equaling one if one of the medium used for the artwork is ink, 0 otherwise.
paint	<i>Paint</i> is a dummy variable equaling one if one of the medium used for the artwork is paint, 0 otherwise.
pencil	<i>Pencil</i> is a dummy variable equaling one if one of the medium used for the artwork is pencil, 0 otherwise.
feltpen	<i>Feltpen</i> is a dummy variable equaling one if one of the medium used for the artwork is feltpen, 0 otherwise.

pasting/mixed medium	<i>Pasting/mixedmedium</i> is a dummy variable equaling one if one of the medium used for the artwork is pasting or mixed medium, 0 otherwise.
action	<i>Action</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to action, 0 otherwise.
ads	<i>Ads</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to advertisement, 0 otherwise.
adventure/suspense	<i>Adventure/suspense</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to adventure or suspense, 0 otherwise.
archetypes	<i>Archetypes</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to archetypes, 0 otherwise.
arts	<i>Arts</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to the arts, 0 otherwise.
death	<i>Death</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to death, 0 otherwise.
erotism	<i>Erotism</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to eroticism, 0 otherwise.
fantasy/magic	<i>Fantasy/magic</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to fantasy or magic, 0 otherwise.
genre	<i>Genre</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to genre scenes, 0 otherwise.
historical context	<i>Historical context</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to historical context, 0 otherwise.
homage	<i>Homage</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork is an homage, 0 otherwise.
humor	<i>Humor</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to humor, 0 otherwise.
interaction	<i>Interaction</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to interaction, 0 otherwise.
landscape	<i>Landscape</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to landscape, 0 otherwise.
love	<i>Love</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to love, 0 otherwise.
portrait	<i>Portrait</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to portrait, 0 otherwise.
science-fiction/high-tech	<i>Science-fiction/high-tech</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to science fiction or high technologies, 0 otherwise.
war/violence	<i>War/Violence</i> is a dummy variable equaling one if one of the subject matter depicted in the artwork refers to war or violence, 0 otherwise.
number of famous heroes	<i>Number of famous heroes</i> is the number of times the hero(es) is/are displayed in the artwork weighted by the Amazon ranking of the album from which they originate.

Appendix B

Table B Regression statistics		
	Model 1	Model 2
Number of Observations	1100	1100
Missing Values	1	1
Number of endogeneous variables	2	2
Censored observations	308	308
Censored observations (%)	0.28	0.28
Log Likelihood	-1595	-418.31
Optimization Method	Quasi-Newton	Quasi-Newton
AIC	3387	1033
Schwarz Criterion	3877	1523