ELECTRONIC PRICE AND TRADING: DETERMINANT FACTORS IN THE SEARCH OF THE LOWEST PRICE

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ABSTRACT

This study treats about an analysis of the electronic bidding in face of the expansion of its use in government procurement, which according to the Ministry of Economy has promoted in recent years more practicality, isonomy, transparency, competitiveness, efficiency and economy. In this scenario, we analyzed the main elements that make up the bidding process, highlighting the effects of negotiations on the bids and the prices reached. The study selected eight factors, estimated price, quantity of bidders, quantity demanded, initial bid, number of bids, type of trading, negotiation and insistence on negotiation. A sample was separated from the eight most bidded objects according to the Ministry of Economy, where data were collected from 1271 bids from 2018. A multiple regression was performed in Excel, placing as independent variables the cited elements and as dependent variable the lowest price reached . Focusing on the trading characteristic of the electronic bidding, an analysis of the incidence of negotiations in public sessions and a general comparison of prices, including all the objects analyzed in the study, was also performed. The results showed that the most relevant factors in the trading results are the number of participants and the estimated price, while trading was not relevant and common when prices were high. However, there was a gain in the overall analysis with price reductions even if already below the estimated. Given this, the study shows that competitiveness and robust price research are crucial for better results and negotiation, although not decisive, provides small gains in public sector bids.

Keywords: Electronic bidding; Publics purchases; Bid; Negotiation.

1 INTRODUCTION

The Institute of Applied Economic Research pointed out in 2018 that the purchases made by the Government represent an average of 12.5% of the Gross Domestic Product, reaching 17.9% in some periods, thus, it is noted the economic importance, the relevance in the administration of public resources and the development potential that are embedded in government procurement.

This influence that public procurement has is even evident in 8.666 of 1993, a law that dictates the basic norms of government procurement procedures, where in its content there is a legal text that attributes to bids, among other purposes, that of promoting national development sustainable, precisely in compliance with the economic potential involved in such a market.

In view of the state's economic objectives and principles related to efficiency, the trading session modality arises, which in its origins comes from Law 9.472 of July 16, 1997, which provides for the creation and operation of ANATEL (Agência Nacional de Telecomunicações - Telecomunications Nacional Agency) which, in its autonomy, establishes in the sole Paragraph of Art. 54 of the aforementioned law, the possibility of using its own procedure for acquisitions and contracting provided that the object does not constitute engineering work and service and the form does not disregard constitutional principles and other gifts of the Bidding and Contracts Law.

The modality has a differentiated approach from those contained in Law 8.666 / 93, standing out mainly for the notable reduction of the period of disclosure of the call notice, the inversion of the bidding and qualification phase, which provides analysis only of the proposal and of the technical and legal requirements of the participant offering the lowest price, and also the appeal period, which in the competition modality is five working days on two occasions, while in the trading session it must be held only immediately after the end of the session.

In this perspective of seeking the evolution of the Public Administration's purchasing methods conciliated with the advances in Information Technology, there is an improvement of the auction mode to its electronic form, regulated by Decree 5.450 / 05, which with its characteristics ensures with greater strength the attendance of principles, such as impersonality, efficiency and publicity, since it allows the participation of any supplier regardless of location, increasing competitiveness and allowing greater practicality and transparency in the public acts present in the sessions.

According to information from the Federal Government's Purchasing Portal, the electronic auction is responsible for more than 90% of contracts and acquisitions, and, according to the Ministry of Economy Portal, the electronic auction provided a savings of 7.9 billion in 2014, with 48 billion reais between the years 2010 and 2015.

Despite the financial gains measured by the difference between the average value estimated by the Public Administration and the ratified values, the Federal Court of Accounts

is not sufficiently satisfied and issues some judgments, among which the 694/2014 - Plenary and 2637/2015 - Plenary stand out , who now demand that public agents who conduct electronic auctions conduct negotiations with bidders.

Thus, it is worth questioning whether the imposition of the TCU is reasonable and whether it provides budgetary benefits in line with such a measure, it is also worth asking whether the bidding procedure as it has been carried out allows the act of trading on electronic trading to be satisfactorily explored.

In this way, the present work highlights the following question as a guideline for the problematization on the agenda: Does the conduct of negotiations on electronic auctions provide the best prices for the Public Administration or are other factors more decisive to achieve the lowest price?

Therefore, it is necessary to analyze the current way of conducting electronic auctions that has characteristics that possibly influence the final price of the event, whether through negotiations in public tenders and the techniques involved or factors such as competitiveness and quantity demanded, therefore, this study seeks to identify the impact of the main aspects of the trading session in the pursuit of the most advantageous price for the Administration.

To this end, eight variables were selected that can influence the result of the bids, namely, the number of bidders, the estimated value, the quantity bid, the number of bids, the attempt to negotiate, the incisiveness of negotiation, the type of auction and the initial proposal registered, in order to ascertain how much they impact on the prices resulting from the electronic auction.

The chosen methodology consists of an empirical research in 880 minutes of public sessions of electronic auctions held via the SIASG System on the Government Procurement Portal of the Federal Government, being limited to the year 2018 and only to electronic auctions, due to the ease of access of the information from them, also restricted to the bidding data for the objects most purchased by the government according to the Price Panel portal in its most homogeneous description to avoid distortions in the prices achieved.

In this way, 1271 items were analyzed among the eight objects most tendered by the Public Administration, coffee, pen, glass, sugar, alcohol, glue, adhesive tape and file folder, in its most common specification. Considering that multiple regressions in Excel, statistical comparisons and price variations in each object are sufficient, it is possible to measure how

factors, such as the number of participants, the number of bids and the number of bids, can affect the results of the trading sessions.

In view of the results, at the end, the established objectives were reached, allowing a conclusion in view of the hypotheses listed in the work and, thus, answering the research problem, if there is economic gain in the conduct of negotiations on the floor or if the other factors present in the event is decisive for achieving the best results in this type of bidding.

2 THEORETICAL REFERENCE

Nunes et. al. (2016) presents through a partial regression analysis correlating the evolution of the GDP between the years 1996 to 2013 with the respective final consumption of the Public Administration that with all the other factors kept constant, BRL 1.00 spent by the government provides an increase of BRL 2.94 in the Brazilian Gross Domestic Product.

In such a way, it is worth noting that in the Brazilian scope, government consumption in 2018 represented 19% of GDP, a value of BRL 1.3 trillion in a consumption of BRL 6.8 trillion according to data from IBGE (2019), and according to IPEA (2018), only spending on government purchases reaches an average of 12.5% of the Gross Domestic Product.

Therefore, regardless of the theoretical outlook, it is notable that there is an impact of public spending on the economy. As a public resource, the decision instrument related to the realization of government consumption, in this way, since these are resources coming from the population, it receives careful treatment from the legislation, and in the case of Brazilian government contracts, it is required bidding process.

Bidding Process or Public Bidding is the name given to the set of formal procedures necessary to carry out contracts between the Public Administration and individuals in a way that meets the interests of the community and does not allow the personal motivations of public agents or third parties to influence the selection of Providers. (NIEBUHR, 2008)

The bids apply to all agencies controlled directly or indirectly by the Federal, District, State and Municipal Public Administration, these being those belonging to the direct administration, special funds, public foundations, autarchies, public companies and mixed economy companies and others that manage public resources when contracting works, services,

purchases, disposals and also concessions and permissions for public services. (DI PIETRO, 2019)

The tenders in general are those provided for in Law 8.666 / 93, however, the trading session came in 1997 with Law no. 9472/97 due to the reformulation of the Brazilian telecommunications system that required faster methods of contracting, therefore, the law of creation of the regulatory agency ANATEL in its articles 54 and 55 has provided for the use of the auction for objects that do not configure as work or engineering service. (MONTEIRO, 2010)

In this way, the use of the auction was limited only to common purchases and contracts, being defined as the acquisitions and services that can be objectively described in public notices by means of usual market specifications, as recommended in Article 1, sole paragraph, of Law 10.520 / 00 which becomes mandatory in electronic mode with Decree 5,450 of 2005. (DI PIETRO, 2019)

A trading session begins with the opening of a process for the characterization of a Public Administration need, when it is necessary to plan which ways to meet the demand, which is the justification for meeting this request taking into account the public interest, which the expected amount and how it will be used. (NIEBUHR, 2015)

Still in the internal phase, the technical requirements that the bidders must have in order to contract with the Administration will be defined, requirements that will be part of the qualification, which in addition to the technical qualification require legal, tax, social security, labor and economic and financial capacity and also declarations of not having an impediment or employing a minor.

The publicity period for the trading session is 8 days and the appeal phase of the trading session is much faster in relation to the other bidding modalities, mainly in comparison with the competition and price taking modalities, in addition, there is a reduction of work with the phase inversion that allows only the best classified bidder's proposal and documentation to be analyzed.

An essential requirement for conducting a bidding process is the price research to reach a value parameter for what you intend to contract, the so-called estimated price, this is due to the need to seek price feasibility, avoid overpricing, comply with legal determinations and

enable another requirement to bid, which is the statement of the budget forecast for meeting the expense.

In this way, the Court of Auditors and the Secretariat of Logistics and Information Technology of the Ministry of Planning launches Normative Instruction no. 05/2014 dictate the parameters of the price survey in order of preference, establishing as sources the government procurement portal, the specialized media, similar contracts and the budgets of suppliers. (NIEBUHR, 2015)

According to (VAZ, 2016), the content of the price survey sometimes does not correspond with the material described in the requisition, a situation that auctioneers are not able to circumvent in the bidding process, because even if they know the effects of bad specifications and incompatible prices, do not have the technical knowledge necessary for a decision.

Fernandes (2013) positioning for an adequate price research points to the importance of considering some factors, such as the variation that occurs in the disparity in the quality of products and their brands, the quantity demanded by the Administration, and the location of the delivery of materials or provision of services.

In another aspect of the estimated price, there is a debate about the disclosure or not of the price on the floor, as there is a doubt as to which method would bring the greatest gain for the Administration, however, TCU's understanding in Judgment 2166/2014 is that the price reference or maximum limit must always be disclosed when the auction takes into account the acceptability of bid prices.

The bidding dispute takes place at the time scheduled for the opening of the session where the bids must be made exclusively via the system and the participants do not necessarily have to cover the lowest bidder, so they can only bid below the last amount proposed by the bidder itself in order to better ranking in the event, it is necessary to clarify that bids of the same value are ordered by the moment of the bid.

After the bidding phase ends, the acceptance of the bids begins, at which point the auctioneers must first negotiate the possibility of reducing the amount offered by the first ranked bidder. The negotiation in the *Comprasnet* system is carried out via chat in direct dialogue with the bidder, where once new values are determined, they will be signed for contracting. (NIEBUHR, 2015)

According to article 24 §8 of Decree 5.450 / 2005, negotiation is a power of the auctioneer, however, the TCU Plenary Judgment 694/2014 clarifies that there is a duty of the Administration to reach the public interest through the best possible value in Hiring, therefore, it is mandatory to negotiate regardless of the final value achieved so far.

Niebuhr (2015) states that the auctioneer's action when trying to reduce the value offered by the best ranked bidder is actually a bargaining attempt, since negotiation suggests that the parties may yield to reach a consensus that is beneficial to both, however, the auctioneer cannot fail to comply with the requirements of the notice, cannot increase deadlines or make other requirements more flexible, given that his actions must obey the determined rite.

Despite the obligation to negotiate given by the TCU 620/2014 Judgment, the auctioneer cannot penalize the bidder who refuses to reduce the value and can only disqualify the bidder if the proposed price is above the estimated by the Administration, it is not reasonable even that the agent responsible for the auction induces the bidder to believe that he will be disqualified for not accepting to negotiate.

Nevertheless, the auctioneer can, through persuasion and bargaining capacity, achieve advantages for the Public Administration, so much so that, Niebuhr (2015) portrays that in bidding through Brazil, agreed benefits are being acquired in addition to the value defined in the final bid of the event, in any case, see this moment as an opportunity to get the best proposal.

In view of the characteristics of the electronic auction, it is evident that this type of bidding consists of a kind of auction, whose offeror of the lowest value is the best classified, thus, it is applied in the analysis, the compatibility that the concepts linked to the theory of auctions have aspects present in the bidding for auctions, with four traditional auction models. Klemperer (2004)

In the case of the trading session, it is similar to the English auction where open verbal offers are made that cover the previous prices where the winner is the one who presents the highest value, taking into account the pre-fixing of the minimum sale value, that is, bids must at least match it to close a deal.

Also compatible with the Dutch auction, where the auctioneer starts with the presentation of a high bid that is reduced until a participant expresses interest in the purchase, however, if the bidder does not acquire the entire quantity offered, the price reduction will continue until the sale of the entire quantity or reaching the minimum acceptable value.

According to McAFEE and McMILLAN (1987), the greater the number of participants in the auction, the greater the competitiveness of the session and, consequently, the reach of a higher price, in addition, the more variation in bid distributions, the tendency is to reach to an advantageous disparity between the winning bid and the second placed, resulting in a greater gain for the seller.

3 METHODOLOGY

The present study focuses on the evaluation of factors that may influence the prices reached in electronic auctions, giving a greater focus to the negotiation item and its impact on the results, thus, in addition to verifying the action of the auctioneer in seeking to reach a price yet better for Management, too, we sought to measure its frequency in being incisive and the financial gain provided.

Thus, in view of the variables considered, it was found to be sufficient, the analysis of the minutes of the trading sessions, which have the number of items, participants and bids, the realization of negotiation made by messages that are recorded in the minutes, in addition to other data that foster the researched scope.

Due to the number of bids in the auction mode, which already represent 90% of the bids, it was necessary to delimit time and for objects purchased, since in 2018 alone, more than 19 thousand auctions were held at the federal level, according to the Ministry of Economy alone.

Therefore, the survey delimited as a sample the eight objects most tendered by the Public Administration in 2018 according to the Federal Government Portal, in addition, it was restricted to the electronic auctions held by the SIASG *Comprasnet* system with the descriptions of the objects in their most common and homogeneous.

The delimitations of the items considered were intended to ensure homogeneity for the analyzed objects, after all, the price difference should not be affected by the peculiarity that some descriptions have. In this way, the units of measurement that best represent the material in the Administration were defined.

The sample had 1271 items, 181 for adhesive tape, 137 for glue, 288 for coffee, 134 for the pen item, 47 for paste sample, 115 for sugar, 134 for alcohol sampling and 235 for the sample. disposable cup, extracted from 880 electronic auctions held by 689 public institutions.

The minutes contain the negotiations carried out by the auctioneers, so, as the agents' bargains are made via chat directly with the winning bidders, raising the incidence of negotiations and the incisivity of the auctioneer required searches by the name of the companies and analysis of the messages exchanged.

In the analysis, any request by the auctioneer to reduce the value of the item studied was characterized as negotiation, whereas in the case of incisiveness, the auctioneer's attitude in re-asking for the decrease in price or presenting arguments and or data in order to obtain a better result was considered. bargain.

In order to control other relevant factors for the price, some other variables, such as the month and the state of realization, were raised in order to recognize possible price differences due to inflation and associated cost of living, however, considering the common nature of the objects selected for analysis and the fact that the estimated price comes from market research, it is understood that this price resolves disparities in inflation or regional cost.

The dependent variable in this research is the final value reached in the auction of electronic auctions and the independent variables defined based on determining factors that can influence the price were the value estimated by the Administration, the number of bidders, the quantity bid, the attempt to negotiate , the incisiveness in the negotiation, the number of bids, the value of the initial proposal and the type of trading session.

In this way, having in hand the data that represent the separate variables for analysis, we proceed to an individualized multiple linear regression for each bid object using Excel, where the final value is categorized as a dependent variable and the number of bidders, value estimated, number of bids, quantity bid, initial bid, negotiation, incisiveness and type of trading as independent variables.

In the case of the variables attempt to trade, incisiveness in trading and type of trading, a qualitative aspect is noted that could not directly be classified on a numerical scale, therefore, in order to shape such a structure, the number of trading variables was assigned the number 1 in the case of "yes" answer, the number 0 for "no" answer and in the variable type of trading session, the number 1 for Traditional Auction and the number 0 for Price Registration, based on the concept of dummy variable by MCCLAVE et. al. (2009).

The variables that revealed more than 95% reliability were established as statistically significant, disregarding the null hypothesis of correlation in these cases. As for

heteroscedasticity, it was analyzed by observing the constant dispersion in the plot of residues and in some cases Pearson's chi-square method was also used in 5%.

In the case of the possibility of multicollinearity, the coefficients achieved and the correlation indexes of the variable were compared, and when the numbers were different, such as high correlation in R^2 with low correlation of variables in the p-value, auxiliary regressions were performed. deleting very relevant or little relevant variables to verify changes in the model.

In addition to these analyzes, the incidence of negotiation was also assessed in a general way, showing the percentage in which the auctioneer's attempt to negotiate and its incisiveness were identified, also seeking to demonstrate some aspects involved, such as the frequency of negotiation when the price is already at or below the estimated price and when it is above.

Once the proportionality between the characteristics of the trading session, the determining factors, the negotiation and the values obtained has been identified, the work presents proposals for understanding the results, demonstrating how much the values imply in practical cases and possible approaches for improving the public procurement scenario.

4 ANALYSIS OF RESULTS AND DISCUSSION

Table 1 - Result of multiple regressions sugar, coffee, glue, pen and paste

	Sugar	Coffee	Glue	Pen	Paste
Multiple R	0,696018	0,716737	0,4192201	0,69058	0,684328
R-Square	0,484441	0,513712	0,1757455	0,476901	0,468305
Adjusted R²	0,445531	0,499769	0,12423	0,443423	0,347231
Standard error	1,64575	5,117004	0,57291	6,320308	0,557527
Comments	115	288	137	134	47
GL Regression	8	**8**	**8**	8	8
GL Residue	106	279	128	125	39
SQ Regression	269,7713	7717,251	8,9578737	4552,298	10,67733
SQ Residue	287,1001	7305,26	42,01285	4993,286	12,12264
MQ Regression	33,72141	964,6564	1,119734	569,0372	1,334666
MQ Residue	2,708492	26,18373	0,328225	39,94629	0,310837
F	12,45025	36,84183	3,41148	14,24506	4,90718
Significance F	1,88E-12	1,37E-39	0,001379	1,32E-14	0,000327

Source: Proper elaboration

Table 2 - Multiple regression coefficients sugar, coffee, glue, pen and paste

		Sugar	Coffee	Glue	Pen	Case
Intersection	Coefficient	5,710851	3,346788	1,3065561	16,02465	1,044033
	Standard error	0,790893	0,789027	0,1096912	1,99689	0,361561
	Stat t	7,220763	4,241666	11,91122	8,024802	2,887573
	P Value	8,19E-11	0,00003	1,78E-22	6,33E-13	0,006303
Number of bidders	Coefficient	**-0,251**	**-0,23645**	**-0,0314388**	-0,43217	0,012354
	Standard error	0,051915	**0,054125**	**0,0104712**	0,106142	0,028134
	Stat t	-4,84372	**-4,3687**	**-3,0024**	**-4,07167**	0,43911
	P Value	**4,37E-06**	**0,000018**	**0,003222**	**8,22E-05**	0,663005
Bidding quantity	Coefficient	-1,2E-06	**0,000124**	**0,00000051**	0,000217	**-0,00012**
	Standard error	5,69E-05	**0,000047**	**0,00000017**	0,000341	**0,000066**
	Stat t	-0,02118	**2,619859**	**2,974792**	0,638052	**-1,79571**
	P Value	0,983145	**0,009278**	**0,003505**	0,524607	**0,080292**
Stimated value	Coefficient	**0,48817**	**0,608858**	**0,0156831**	0,305882	0,389928
	Standard error	0,062747	**0,040107**	**0,0076422**	**0,04826**	**0,099462**
	Stat t	7,780018	**15,18084**	**2,052182**	6,338179	3,920358
	P Value	**5,05E-12**	**2,34E-38**	**0,042191**	**3,85E-09**	**0,000347**
Negotiation attempt	Coefficient	0,111229	0,489941	0,0074774	**4,934292**	-0,08161
	Standard error	0,422735	0,760785	0,1289109	**1,440722**	0,193789
	Stat t	0,263117	0,643994	0,058005	**3,424874**	-0,42113
	P Value	0,792971	0,520108	0,953835	**0,000833**	0,675968
Incisivity	Coefficient	0,114867	-0,33926	0,1073099	1,539348	0
	Standard error	1,227424	1,491994	0,3093919	3,050035	0
	Stat t	0,093584	-0,22739	0,346841	0,504699	65535
	P Value	0,925616	0,820289	0,72928	0,614659	#NÚM!
Number of bids	Coefficient	-0,00374	-0,00273	-0,0005085	-0,01683	-0,00446
	Standard error	0,003925	0,006192	0,0009061	0,011501	0,003024
	Stat t	-0,95242	-0,44105	-0,56116	-1,46377	-1,47397
	P Value	0,343049	0,659521	0,575667	0,145768	0,148516
Initial proposal registered	Coefficient	-0,00432	0,004464	0,0002519	**0,008028**	0,00010
	Standard error	0,00722	0,004986	0,0002149	**0,002331**	0,000059
	Stat t	-0,59851	0,895353	1,17199	**3,443738**	1,651339
	P Value	0,550773	0,37137	0,243378	**0,000781**	0,1067
Type	Coefficient	1,121869	**2,629644**	0,1494545	1,255969	0,26898

Standard error	1,042922	**0,909239**	0,1329123	1,416244	0,424447
Stat t	1,075698	**2,892136**	1,124459	0,886831	0,63372
P Value	0,284505	**0,004128**	0,262922	0,376873	0,529963

Source: Proper elaboration

Among the variables analyzed in the sugar sample, only the number of bidders and the estimated value had a significant significance of more than 95% in the results of the electronic auctions for this object according to the "p-value" of the regression, and, as for the others , the variable that came closest to a considerable level of significance was the type of trading session, which reached 72%.

In this case, the number of bidders impacts on a reduction of BRL 0.25 for each additional participant in the bid in a standard error of less than 0.6%, while the estimated price has an effect of an increase in the price of BRL 0.49 for all BRL 1.00 plus the amount estimated by Management with a standard error of 0.6% as shown in Table 2.

In the analysis of coffee, there were four variables as determining factors in the prices obtained in the electronic auctions carried out via SIASG, thus, the analysis shows that the quantity of bidders affects a decrease of 23 cents for each additional bidder, while the quantity demanded applies a an increase of less than one cent, and the estimated value disclosed has an impact of an increase in price of BRL 0.60 with a standard error of only 0.040.

The analysis of the trading sessions for the purchase of glue reveals a correlation of 41.9% between the variables, highlighting a small variation of the dependent variable in relation to the oscillations of the independents in 17.57% of R² with an adjusted R² of 12.42%, with the variable number of bidders providing gains for the Administration of BRL 0.03, and the quantity of material and estimated value resulting in an increase of less than one cent.

Among the independent variables that are not statistically significant, the number of bids promotes gain with each additional bid, however, less than a penny, in addition to this, the variable related to the incisiveness with only 27% of significance and the one corresponding to the dummy of the type of 74% bid, when the acceptable is 95%, shows higher prices when incisive negotiation occurs and bidding is by traditional auction.

The result of the regression analysis of pen bids demonstrates an explanation of the model of 69.05%, with a change in the dependent variable correlated by 47.69% in R² with

adjusted R² in 44.34%, with considerable F test and greater significance. at 95%, an occasion that shows no evidence of multicollinearity due to the proportionality of these indices and the number of significant variables in the p-value.

The multiple regression of the trading floor sample for the acquisition of pens shows considerable correlation in the variables number of bidders, estimated value, attempted negotiation and initial proposal of the winner, where the first provides a gain of BRL 0.43 for each additional supplier, the second a reduction of BRL 0.30 for each estimated real, an increase of BRL 4.93 in the third variable and less than BRL 0.01 in the fourth.

In this analysis, we highlight the significant increase in values when trading occurs at the event, however, this result corroborates with probable factual aspects in bidding processes, which is the common attempt at negotiation when prices are clearly high.

The multiple regression of the portfolio had a much smaller sample than the other analyzed objects, only 47 bids, so much so that the incisivity variable of the auctioneer did not obtain a coefficient and significance index, since no incisive attempt at negotiation was found, despite that, in accordance with the other analyzes and has a percentage of explanation of the model is 68.4%, the correlation of the variables indicates 46.8% in the R² and 34.7% in the adjusted R².

The analysis of the sample of the auction of pasta had only the variable value estimated as significant, therefore, the result showed an increase of 39 cents for each real varied in the estimated, being that the quantity bid comes close to the ideal level of significance with 92 % and showing a savings gain in the events of less than 1 cent per additional unit.

Table 3 - Result of multiple regressions: glass, ribbon, alcohol

	GLASS	GLASS AUX.	TAPE	TAPE AUX.	ALCOHOL	ALCOHOL AUX.
Multiple R	0,950135749	0,133418	0,976294	0,256116	0,902459	0,241826
R-Square	0,902757942	0,0178	0,95315	0,065595	0,814432	0,05848
Adjusted R²	0,899316	-0,01249	0,950971	0,027787	0,802556	0,006173
Standard error	1,31778	4,178854	1,062831	4,732823	4,815875	10,80458
Comments	**235**	**235**	181	181	134	134
GL Regression	8	**7**	**8**	7	8	7

GL Residue	226	**227**	172	173	125	126
SQ Regression	3643,441	71,8405	3952,875	272,0344	12723,65	913,6138
SQ Residue	392,4593	3964,06	194,2928	3875,133	2899,081	14709,12
MQ Regression	455,4301	10,26293	494,1094	38,86206	1590,456	130,5163
MQ Residue	1,736545	17,46282	1,129609	22,39961	23,19265	116,739
F	262,262156	0,587702	437,4162	1,734943	68,57588	1,118017
F for meaning	7,9318E-110	0,76565	4,7E-110	0,103719	4,67E-42	0,35592

Source: Proper elaboration

Tabela 4 - Coeficientes regressões múltiplas copo, fita e álcool

		COPO	**COPO AUX.**	**FITA**	**FITA AUX.**	**ÁLCOOL**	**ÁLCOOL AUX.**
Intersection	Coefficient	0,494141189	3,629863	-0,17721	4,772892	2,485481	11,24349
	Standard error	0,185064	0,544363	0,20005	0,802785	0,934294	1,906709
	Stat t	2,670108	6,668088	-0,88581	5,945415	2,660278	5,896803
	P Value	0,0081334	1,95E-10	0,376959	1,49E-08	0,008831	3,19E-08
Number of bidders	Coefficient	**-0,067369751**	-0,02103	**-0,0794**	**-0,1915**	-0,14302	**-0,49104**
	Standard error	**0,014909**	0,047167	**0,018001**	**0,079679**	0,109428	**0,243056**
	Stat t	**-4,51873**	-0,4458	**-4,4112**	**-2,4034**	-1,30697	**-2,02026**
	P Value	**0,00001**	0,656166	**0,000018**	**0,017301**	0,193621	**0,045477**
Bidding quantity	Coefficient	**0,00001174**	-1,3E-05	**0,000010**	1,8E-05	-9,9E-05	3,89E-05
	Standard error	**0,0000052**	1,65E-05	**0,0000005**	2,13E-05	9,45E-05	0,000211
	Stat t	**2,246047**	-0,81044	**2,01248**	0,843878	-1,05194	0,18409
	P Value	**0,025668047**	0,418535	**0,045729**	0,399903	0,294856	0,854239
Stimated value	Coefficient	**0,755032995**	-	**0,945127**	-	**0,556968**	-

	Standard error	**0,016649**	**-**	**0,016557**	**-**	**0,024682**	**-**
	Stat t	**45,35116**	**-**	**57,08334**	**-**	**22,56579**	**-**
	P Value	**1,8021E-115**		**1E-113**	**-**	**6,55E-46**	**-**
Negotiation attempt	Coefficient	0,374034027	-0,68368	0,016203	**1,813125**	0,227998	-2,26811
	Standard error	0,24235	0,764955	0,193603	**0,850647**	1,012969	2,259042
	Stat t	1,543365	-0,89375	0,083694	**2,131465**	0,225079	-1,00401
	P Value	0,124141278	0,372402	0,933397	**0,034463**	0,822286	0,317296
Incisivity	Coefficient	-0,123825438	-0,04428	0,483318	-2,35779	0,856401	-0,23156
	Standard error	0,593208	1,881132	0,437688	1,936399	2,215293	4,968911
	Stat t	-0,20874	-0,02354	1,104251	-1,21761	0,386586	-0,0466
	P Value	0,834840319	0,981242	0,271026	0,225029	0,69972	0,962905
Number of bids	Coefficient	**-0,006999905**	-0,00358	-0,00268	0,000795	-0,00109	0,001022
	Standard error	**0,002932**	0,009295	0,001932	0,0086	0,012575	0,028213
	Stat t	**-2,38739**	0,38549	-1,38565	0,092387	-0,08647	0,036238
	P Value	**0,017791724**	0,700235	0,167648	0,926497	0,931228	0,97115
Initial proposal registered	Coefficient	-1,63853E-05	0,00205	0,000015	-9,7E-05	0,000141	0,000112
	Standard error	0,000608	0,001922	0,000042	0,000188	0,000491	0,001102
	Stat t	-0,02695	1,066434	-0,35665	-0,51745	0,286741	0,101319
	P Value	0,978521907	0,287361	0,72179	0,605503	0,774786	0,919459
Type	Coefficient	-0,68323645	-0,34197	**0,497236**	-1,84894	1,000316	-0,66032

Standard error	1,325493	4,203245	**0,238145**	1,044553	1,154867	2,585718
Stat t	-0,51546	-0,08136	**2,08796**	-1,77008	0,866175	-0,25537
P Value	0,606736696	0,935229	**0,038275**	0,078475	0,388054	0,798852

Source: Proper elaboration

In view of the high percentages of correlation in the analysis model for cup bids and the number of significant variables, there is a discrepancy in the model, probably due to the impact on the price that the coefficient of the estimated price variable presents, thus, it was carried out a new regression suppressing this variable and the result shows that the others were not significant, however, six out of the seven impact a reduction in price even if small.

It should be clarified that the analysis of the eight variables showed an average gain of BRL 0.07 for each additional bidder in the event, while the quantity demanded demonstrated an influence on the price increase by less than a cent and the estimated value on an impact of BRL 0.75, in addition, the number of bids indicates a win, however, less than a penny.

In the regression over the sample of the electronic auctions of adhesive tapes, the same discrepancy possibly noted is attributed to the relevance of the coefficient of 0.94 of the estimated value, therefore, a regression was performed without the variable and the result achieved reiterates the negation of the null hypothesis for the number of bidders that reduces the price by 19 cents and makes trading a significant variable.

The quantitative variable of the material provides an increase of less than a penny and the type of trading affects about 0.50 more when it comes to traditional trading, however, it is worth clarifying that the average quantity in the trading sessions for certain purchases is 134 with 5.6 participants, while in bidding for price registration the average quantity is 2733 with 9.35 competitors.

The analysis referring to the trading sessions for Alcohol shows an explanation of the model in 90.24%, with R^2 in 81.44% and 80.25% in the adjusted R^2, demonstrating a strong correlation of the independent variables over the dependent variable, that is, in a quite F high with 95% greater significance than the reliability.

However, considering the variables in which the null hypothesis can be rejected, the analysis of the alcohol object obtained a savings gain only related to the estimated value, with

an influence on the value of 55 cents for each estimated real, thus, due to the disparity of statistical indices and the significance of the variables, two auxiliary regressions were performed, one suppressing the variable estimated price and the other dispensing all the others.

Considering that, comparing the multiple R and R² of the two regressions, it is noted that the regression without the estimated price has an explanation of the model and correlation of the variables in only 24.18% and 0.05%, while the regression only with the estimated value it has 89.33% of explanation of the model and 79.80% of correlation.

In such a way, it appears from the analysis that the price estimated by the Administration corresponds to the most determining factor for the bidding result, however, it should be pointed out that the variable negotiation with a p-value of significance of 69% provided in the absence of the estimated price a considerable coefficient of price reduction on the floor.

Bringing the negotiation to the focus of the analysis, the result of the research shows that, despite the jurisprudential mandatory, only in 26.59% of the electronic auctions there are bargaining attempts by the auctioneers, however, only in 3.38% of the analyzed bids , public agents' insistence on negotiations was perceived.

It is observed in the sample that only 21.30% of the negotiations took place above the estimated value, while the percentage of bargain when the lowest bid in the event was already below the estimate was 78.70%, however, the result of the negotiations is much more effective when the value of the final bid is above the estimated, since, on this occasion 93.06% of the bidders agreed to reduce the value, on the other hand, only 30.08% of the negotiations below the estimated were successful with relevant financial gain.

In this way, negotiations on electronic auctions tend to respect the estimated value, and bidders demonstrate that they know that the price item is subject to adjustment when the price is higher than that surveyed by the Administration, possibly because the price is an acceptability criterion of the proposal in the trading sessions.

In view of the analyzes, it is clear that other factors present in the electronic auctions may have greater relevance in reaching the best price, however, considering only the negotiations that were successful with the acceptance of the bidder in reducing the price, there is a gain average savings of 1.26%.

In view of the results, it was found that among the variables analyzed, the one that was most determinant in the results of the trading sessions was the estimated value, which had considerable significance in all analyzes with coefficients close to or greater than 0.5 in five of the eight regressions. , even representing an impact of 0.75 and 0.94 on the final price of two research objects.

In this way, the research confirms something that the doctrine of the bidding area has already manifested, that the final prices on the floor tend to the estimated, therefore, the importance of conducting price research that faithfully represents the values of preferably adjusted so that the estimated value does not pull the lowest price upwards.

As the results of the trading sessions commonly follow the estimated price, it is explained why the attempted negotiation has an effect of increasing prices, that is, the prices in the trading sessions would already be with a final value exactly equal to the estimated or lower, and even being high there was no reduction in the amounts since the Administration has already been willing to pay that amount and the jurisprudence prevents the proposal from being rejected within the estimated amount and allows negotiation with only the first place.

In this way, the fact that the regressions show that in six of the eight analyzes there is an increase in prices in the presence of trading, in fact it shows that auctioneers tend to trade when the values are high and above the estimated.

In this sense, it is worth noting that the incisiveness of the auctioneer does not have much practical effect for achieving good prices, so much so that in none of the analyzes of the models was this variable significant, therefore, even if measures are taken to intensify the negotiation techniques , training and professional incentive to the auctioneer, probably little result would be achieved, since the main determinants of prices, such as estimated price, have their characteristics cast in jurisprudence.

On the other hand, one of the aspects that showed the most results for reaching lower prices was the number of bidders that was significant in six of the eight analyzes and showed financial gains for the Administration in seven of the eight objects, in addition to this, the variable number of bids also had a positive effect on the results, in this case, on all regressions, however, with a p-value of significance less than 95%.

In such a way, it is concluded that the characteristics of the auction corroborate with the Theory of the auctions to obtain better results with more participants and bids, therefore, it

is understood that measures to attract the largest number of bidders are essential for the bids to be well In this way, advertising practices, attractiveness of the object in the trading sessions, no restrictive requirements and other attitudes that may compromise competitiveness should be intensified.

As for the type of trading session, whether traditional or SRP, or the initial registered offer proved to be significant in a few analyzes and little relevant or inexpressive in the final value, however, the variable quantity demanded indicates in the regressions an increase in prices in five of the eight analyzes , being statically significant in four objects, even with very low coefficients, therefore, it is concluded that the amount of demand has little impact on public tenders.

Even so, through an analysis of the percentage difference between the estimated and the lowest price of all objects, considering only sessions in which the suppliers agreed to decrease the offered value, regardless of above or below the estimated, an average gain was found 1.26% price reduction in relation to the estimated.

In view of this, it can be answered that trading is capable of generating economic gain in some cases, however, it is not an aspect of great relevance, and the factors present in the trading session that most influence the results are, firstly, the price estimated by the Administration by pulling the value commonly upwards, and in second and third place, the number of bidders and the number of bids promoting effects of reduction of the final value.

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