The Effect of the Winner's Curse on Independent Audit Public Procurement

ABSTRACT

Objective: This research investigates the effect of the winner's curse on public hiring of independent audits.

Method: The study was quantitative, with 73 contracts via electronic procurement of state-owned companies between 2010 and 2020 for hiring independent audit firms. Data were analyzed using multiple linear regression and quantile regression.

Originality/Relevance: This is the first study conducted in Brazil using federal government electronic auction data to study the effect of the winner's curse.

Results: The results show that this type of contracting causes high competition among audit firms, increasing the variation between the estimated price and the contracted price, affecting fees, especially for initial audits. Using performance management as a proxy for audit quality, it was not possible to determine its influence. However, in the additional test, using OLS without the constant, the regression result indicates statistical significance.

Theoretical/Methodological contributions: The study used an available database to make a connection between the auction process that occurs in the federal public sector.

Social/Management contributions: Elements have been obtained that raise doubts about the effectiveness of the electronic auction for contracting independent auditing services.

Key words: Independent Auditing, Winner's Curse, Auditors' Fees.

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1 INTRODUCTION

There is a gap in the studies carried out regarding empirical work on the debasement of auditors' remuneration. In-depth research on how this reduction in the amounts paid to professionals occurs and how this affects results has not been found on the national scene. One of the reasons for the lack of studies in this area is that the process of choosing auditors is still opaque, making it difficult for researchers to analyze the situation with due care. Furthermore, the issue of debasement itself is controversial, since the researcher does not have adequate proxies to determine its occurrence.

International research shows that the audit service market resembles a procurement auction – seller version – in which auditors generate a private estimate of the real cost of an audit before proposing a price to the client. However, this estimate may reveal low-ball supply (Hobson et al., 2019; Santtley et al., 2021).

In this situation, state-owned companies offer fertile ground on the subject. Brazilian legislation also establishes that the hiring process is carried out following a ritual that is transparent and involves reasonably objective criteria.

For the context of Brazilian state-owned companies, this audit contracting process takes place through bidding, an auction mechanism in which the provider offers its goods or services. Starting from a reference value, normally the market average for the required service, a dispute between auditors begins with offers, over a period of time, until there is a more advantageous proposal for the contracting party. This reduces the referential value of the audit service offered. The widespread use of this type of dispute is justified by its speed, procedural simplicity and systematic selection of the best proposal (Santana and Santos, 2012).

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The concern about the debasement of auditors' fees, as a result of electronic auctions, was the subject of analysis by the Federal Accounting Council (CFC). The Council recommended that professional auditors not participate in auctions, arguing that the use of this modality could lead to an ethical infraction characterized as debasement of fees. Subsequently, the CFC changed its opinion by considering Ruling 1046/2014 of the Government Audit Court.

Considering the auction as a reverse auction for hiring audits and the consequent possibility of debasement of their fees, it is assumed that the winner's curse will occur in the hiring process. Therefore, concern arises about the effects of hiring independent auditors on the final contracted price and the consequences on the performance of the service.

This research aims to address a gap in the existing literature on the market dynamics of audit services from the perspective of a procurement auction. This study aims to advance the understanding of auditors' fees, empirically investigating issues related to the amounts paid, quality and audit service. By focusing on the specific context of Brazilian state-owned companies, which contract audits through bidding, this research has the potential to elucidate the effects of this practice on the integrity and effectiveness of the audits carried out.

Furthermore, by exploring the concept of the winner's curse in the context of electronic auctions used to contract audit services, this work seeks to offer insights into the consequences of this phenomenon on fees and the general quality of the services provided. This analysis is essential to understand whether current practice promotes competition that can, paradoxically, lead to a deterioration in the quality of audit services due to pressure to reduce costs. This research is pioneering in investigating the reduction in auditors' fees and the quality of independent auditing in Brazil, whether due to the scope and sample used. Existing studies did not evaluate from a price reduction perspective. Studies on initial audits were carried out to assess the impact of a change of auditor.

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Given the above context, this research has the following problem: What is the effect of the winner's curse on public contracting of independent auditing through auctions? The research's initial concern is that audit costs are affected by the electronic auction contracting model, anchored in the winner's curse.

2 LITERATURE REVIEW

2.1 Auction Theory and the Winner's Curse

Auction Theory is based on an economic design for negotiation that seeks to balance the presence of information asymmetry, thus establishing balance in supply and demand and a winner willing to assume the risk of asymmetry (McAfee and Millan, 1987). Auctions are characterized by providing greater flexibility in determining prices, a result of the negotiation process and broad competition between buyers and sellers (Menezes et al., 2007).

For the auction process, via auction, auditing companies estimate the value for the service, as well as the technical hours, based on the equity information of the contracting companies. This premise is different from other common value auctions, in which the bidder does not know the true value of the object to be auctioned. The degree of competitiveness is a determining factor for variations in bids between the estimated value and the winning bid: the greater the number of participants, the greater the chance of the winner's curse occurring (Vanzan and Avila, 2008).

The existence of the winner's curse conflicts with rational methods adopted by bidders, leading to the pricing of services with an irrational bias. It is possible to imagine that in audit contracting auctions, the bidder, in an attempt to avoid losing the bid, will seek to maintain the bid supply. As a result, there will be a reduction in the winner's earnings, as his victory will reduce his profit, and may even cause a loss. The existence of contracting at a price below cost will imply lowballing, translated here by the term debasement.

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Blankley et al. (2021) defined the winner's curse in the audit environment as winning a new contract, leaving the auditor worse off, earning lower-than-expected profits, experiencing loss of work, or, even worse, facing reputational damage. Debasement, in the context of auditors' fees and its effects on the conduct of work, is a recurring concern for market regulators and the subject of international studies (Stanley et al., 2015).

The fight to win the client generates a reduction in fees, with potential impacts on the execution and quality of services. DeAngelo (1981) considers that the price dispute does not reduce the auditor's independence, as he seeks to guarantee the continuity of his contract. Such a condition would be contrary to the victor's curse. However, as the hiring process in state-owned companies needs to be done via the lowest price, DeAngelo's considerations may not be applicable for this type of company.

Deis Jr and Giroux (1996) sought to investigate the relationship between fees and audit quality, based on initial audits. The study showed that for the first year of audit the fees are reduced, but the quality of the audit is high, with a greater number of technical audit hours. Coate and Loeb (1997) evaluated a controlled dispute model between groups of auditors and carried out an experiment using symmetric information on the real cost of carrying out an audit, whose scenario gave rise to the winner's curse. The researchers' model demonstrated that debasement is not associated with the loss of independent audit quality.

Ettredge et al. (2014) investigated the pressure on fees resulting from the 2008 global financial crisis. The research results suggest that the reduction in auditors' fees is associated with a reduction in quality. The research by Chen et al. (2018) also evaluated the relationship between the reduction in fees during the global financial crisis and the quality of profits, via earnings management, and the quality of independent auditing. As a result, they did not identify significant differences in the quality of profits for companies with reduced audit fees. The reduction in audit fees as a result of the financial crisis was also studied by Climent-

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Serrano et al. (2018). The authors mention that the decrease in the number of companies subject to the post-crisis audit process increased competition in the audit market, generating a reduction in the amount charged.

Cho et al. (2021) investigated the reduction in fees, using as a parameter the occurrence of debasement when there is a reduction equal to or greater than 30% in the amounts charged by auditors, and its effects on quality. The conclusion of the study is that debasement does not affect the quality of the service performed by the auditor.

Novak & Knechel (2023) examined the initial costs of audits, as well as those of ongoing services, with the intention of understanding the nature of audit fees when changing auditors. In this search, in addition to providing a better understanding of the composition of audit costs, the authors highlight that audit prices are a result of competitive market forces, rather than low-ball practices.

The relationship between audit fees and service quality, as in other studies previously reported, is also explored by Hallman et al. (2023). The authors analyzed whether discounting in audit fees occurs and (to the extent it occurs) whether it affects audit quality. Among the conclusions of the study, it is highlighted that, in the initial years, auditors who offer greater discounts on their fees are more likely to issue opinions with clean opinions on financial statements that contain distortions. The results are consistent with the winner's curse phenomenon, which predicts that competitive bidding will result in newly appointed auditors who underestimate client risk.

2.2 Determinants of Independent Auditing fees

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The conditions that impact auditors' fees are the subject of study in several studies. Bortolon et al. (2013) argue that to maintain a reputation for quality and specialization, costs are necessary for the auditing company, which can mean higher prices.

From the literature review on the topic, it is possible to verify that the common variable in studies applied to independent audit fees is the size of the audited company, positively affecting the prices charged by auditors (for example, Karim and Moizer, 1996; Brinn et al., 1994, Rusmanto and Waworuntu, 2015).

Some studies relate the audit price and levels of corporate governance. Ettredge et al. (2018) demonstrated that the implementation of SOX increased the demand for professional services, with a positive effect on the fees charged. But, on the other hand, better governance can mean less effort spent on work. In this case, the corporate governance variable has a negative effect on fees. Griffin et al. (2008) showed that after the SOX implementation period, the effect of better governance reduced the cost of independent auditing.

As an additional finding, the study by Ettredge et al. (2018) did not identify any evidence that the higher amounts charged by auditors are accompanied by improvements in quality in terms of decreases in discretionary accruals.

Each audit service is a specific order, considering that the characteristics are varied. Thus, each service will have a price formation. A study presented by Castro et al. (2015) the pricing of fees is given by estimated hours and an hourly rate. Another important factor is the assessment of client risk and the extent of audit testing.

Studies that empirically evaluated the variables that influence auditors' fees demonstrate that these fees are positively affected by the size of the companies, the complexity of the client, the size of the audit firm, financial leverage, the positive difference between the accounting profit and taxable profit – Book-Tax Differences (BTD) – and the use

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of discretionary accounting practices (Ávila et al., 2017; Simão et al., 2020; Castro et al., 2015; Dantas et al., 2016).

Studies show that fees are negatively affected by the level of corporate governance, the fact that the audit is carried out in the first year of the contract, understood as the effect of auditor rotation, and the greater concentration of ownership (Ávila et al., 2017; Castro et al, 2015; Dantas et al., 2016; Simão et al, 2020).

2.3 Quality of accounting information and auditing

In relation to the context of state-owned companies and the quality of accounting information, it is also expected that the independent audit of these companies will mitigate information asymmetry and conflicts of interest in commanding operational and strategic decisions. Problems associated with conflict of interests are related to issues of political party alliances regarding appointments for management of these companies. But it is worth highlighting that, ultimately, the ownership of these companies belongs to citizens who contribute to the public budget.

Political ties can distract from value creation. The privilege of political patronage may prevail, penalizing society. Research seems to indicate that state-owned companies have incentives to present higher results, strongly affected by earnings management, to demonstrate a good image of the government (Scalzer et al., 2017).

In this context, the importance of independent auditing in these companies is evident. Their hiring seeks to respond to the market and society in order to ensure that the decisions and information disclosed are adequate within the structures and guidelines applicable to these companies.

There is a consensus that the usefulness of accounting information is directly related to the decision-making power it offers to its users. The approach found in the literature, in the

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context of the quality of accounting information, finds in the quality of profits a measurement proxy. When the result is discretionarily affected by the anticipation or delay of accounting recognitions, supported by professional judgments related to estimates and provisions, this utility is negatively affected (Dechow et al., 2010). For Martinez (2008), the difference between net profit and operating cash flow, a result of accruals, lies in the manager's discretion to increase or decrease these accruals, with the aim of changing a company's profit.

When investigating state-owned companies directly controlled by the Government and when evaluating the quality of the accounting information reported by these companies, it is defensible to consider that earnings management characterizes a strong attribute to measure this quality.

Thus, the research has the following hypothesis: the debasement of fees has a negative impact on the quality of independent auditing.

Results-based management and independent auditing are the subject of several empirical studies that seek to evaluate the effects of the work performed by the auditor in examining financial statements and the earnings management measured in these statements. Azevedo and Costa (2012) and Parreira et al. (2020) evaluated the effect of audit firm rotation on the level of earnings management. The results indicated that there was no statistically significant difference in the level of management before and after the change of auditors. The research by Christensen et al. (2016), for example, showed that audit firm rotation reduces the volume of discretionary accruals.

For Arcúrio Júnior and Gonçalves (2020), the variables of the size of the auditing company, the time it takes to provide audit services and the auditor's degree of specialty influence the improvement of the quality of accounting information. And they reduce information asymmetry, thus associating the quality of independent auditing.

3 METHODS

The research is initially supported by the collection of information about contracts carried out through electronic bidding, between the years 2010 and 2020, available on the Federal Government's purchasing portal (COMPRASNET) and on the Banco do Brasil bidding portal (licitacoes-e). Due to this source of information, the research was restricted to Government state-owned companies. As there is no centralization of information, it was necessary to search for notices and other information on tenders carried out on each company's transparency portal.

Information was collected from independent audits of 46 state-owned companies directly controlled by the Government, with 72 observations in total. Financial information was also collected from the audited companies. The barrier to searching for information from minutes and financial statements was the lack of direct access to the information. To resolve such cases, a request for access to information was made, based on Law No. 12.527/2011, from 18 companies.

The study used multiple linear regression. As an alternative to the problems of normal distribution of errors, homogeneity and outliers, quantile regression was also used (Koenker and Basset, 1978). To deepen the analysis, alternatively, the expression (PLini-Pv)/(PLini) was also tested as a dependent variable of interest, in its definition of debasement. The modification occurs by replacing the bidding reference price (Pr) with the average variable of the initial bids (PLini) offered by the firms participating in the auction. The change is justified by concerns about the effectiveness of the quotation procedure carried out by state-owned companies to define the reference price published in the bidding notice. It is common for this reference price to be defined by previous hiring history, and may not, in fact, represent the fair value of the fees adopted in the market by auditing firms.

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To evaluate the consequence of the debasement in the quality of accounting information, the earnings management model was used through discretionary accruals. For this, the model developed by Kang and Sivaramakrishnan (1995), known as the KS model (1995), was used.

$$AD_{it} = AT_{it} - \{\beta_0 + \beta_1[\delta 1_{Recit}] + \beta_2[\delta 2_{Despit}] + \beta_2[\delta 3_{At.Imobit}]\} + \varepsilon_{it}$$

The expression variables were extracted from the financial statements, as follows:

AT_{it} = Total Accumulations = (CGL – Depreciation & Amortization)

Rec_{it} = Net Revenue (excluding taxation)

$Desp_{it}$ = Operating Costs and Expenses before Depreciation & Amortization

CGL = Net Working Capital excluding cash, short-term financing and provision for Taxes Payable

$At.Imob_{it}$ = Fixed Assets and Deferred Assets

C. Receivable $_{i,t-1}$ = Accounts Receivable in period $t-1$

$DEPREC_{i,t-1}$ = Depreciation Expenses

$\delta 1$ = C.Receb$_{i,t-1}$/ Rec$_{i,t-1}$, where AR (accounts receivable)

$\delta 2$ = (ΔCG – CRec$_{it}$) / Desp$_{i, t-1}$

$\delta 3$ = DEPREC$_{i,t-1}$/A.Imob$_{i,t-1}$

The variables Rec$_{it}$, Desp$_{it}$ and At.Imob$_{it}$ are divided by total assets, in t-1, seeking to reduce the problem with heteroscedasticity in relation to scaling the size of companies.

The KS model is the one that offers the best results for estimating the discretionary accruals of Brazilian companies (Martinez, 2008; Almeida and Almeida, 2009). The research used the discretionary accrual obtained and related it to debasement, audit delay, Big Four, CVM Registration, opinion and emphasis. The meaning of these variables is in Figure 1.

Figure 1

Description of the accruals model variables

Variable	Description	Expected sign of the Coefficient	Researches
Debasement	Difference between the bid price and the winning price		

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Year	Year of electronic auction	Positive, the history of fee reductions from the previous year forces the value down	
Number of participants	Number of participants in a trading session	Positive, by increasing the number of competitors, the chances of the winner's curse increase	Menezes et al. (2007); Vanzan e Avila (2008); Sobral e Silva Neto (2020).
Auction minutes	Duration in minutes of the trading session	Positive, as bidding is a gradual reduction in prices, so it is suggested that the longer bidding takes place, the greater the price reduction.	Farias et al. (2010)
Big Four	Binary being 1 if the winning firm is Big Four	Negatively, the size of the audit firm is associated with an increase in fees charged, thus reducing the variation in debasement	Castro et al. (2015); Dantas et al., (2016);
		Positive	Simão et al. (2020)
CVM registration	Time (years) that the winner has registered	Negative, it is expected that the auditor's working time will increase reputation and quality, with less risk of reducing its price	Bortolon et al. (2013)
Previous Firm participated	Binary being 1 if previous audit participated	Negative, the previous audit firm is able to better quantify the audit effort and quantify the fees, holding the price reduction	Castro et al. (2015); Blankley et al. (2021).
Previous firm won	Binary being 1 if previous audit won	Positive, the persistence of the previous audit firm increases the chance of price reduction	Stanley et al. (2015); Blankley et al. (2021).
Total Assets	Natural logarithm of the state-owned company's total assets	Negative, as the size of the audited company affects the volume of work and limits the willingness to reduce fees	Brinn et al. (1994); Karim e Moizer (1996); Khishman e Zhang (2014); Rusmanto e Waworuntu (2015); Castro et al. (2015); Dantas et al. (2016); Simão et al. (2020).

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4 RESULTS

4.1 Results Presentation

In order to observe important aspects of the variables studied, descriptive statistics are presented (Table 1), except for qualitative variables. These are demonstrated in Table 2.

Table 1

Descriptive statistics of variables

Variables	Average	Median	Minumum	Maximum	Standard deviation	N
Estimated Value (P_r)*	1,977.50	160.00	20.00	57,687.00	8,244.00	73
Starting bids (P_Lini)*	1,541.00	45.00	6.71	46,000.00	7,100.40	73
Contracted Value (P_v)*	1,857.50	175.45	24.78	46,000.00	7,202.10	73
Debasement (P_r)	0.59	0.68	0.00	0.94	0.26	73
Debasement (P_Lini)	0.63	0.70	0.00	0.97	0.25	73
Year	2017	2018	2010	2020	2.40	73
Number of participants	8.34	8.00	1.00	18.00	3.96	73
Auction minutes	45.55	39.10	12.47	187.78	29.59	73
CVM registration	10.37	6.00	0.00	40.00	10.06	73
Total Assets (log)	14.09	14.19	10.22	21.11	2.32	72

Note: * Values in thousands of R$

Table 2

Frequency

	Absolute Frequency	Relative frequency (%)
Big four	6	8%
Previous firm participated	57	78%
Previous firm won	22	30%
Type of opinion	22	31%
Emphasis	29	40%

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It is possible to observe that, for variables Estimated Value (Pr)*, Initial Bids (PLini)* and Contracted Value (Pv)*, variables used to define the dependent variable object of this study, their means differ from the median, strongly affected by extreme values. In the data set, there were five auctions whose initial bids (PLini) were above R$ 5 million, the four being financial institutions (Banco do Nordeste, BNDES, Caixa Econômica Federal and Banco do Brasil), in addition to Eletrobras. The state-owned electricity company had the maximum Contracted Value (Pv)* of R$ 46 million.

The dependent variable object of this research, Debasement (Pr), had a median of 68%. The debasement measured by the average of the initial bids is close to this value (70%). In terms of the level of competition, it is possible to note that the average number of auction participants is 8 auditing companies. The auction time was 46 minutes on average. For the auctions analyzed, 30% had previous audit companies as winners. The presence of large firms – Big Four – in these processes is only 8%, as well as the average of 10 years of experience of the audit firm in relation to the time of registration with the Securities and Exchange Commission, however far from the median which represents 6 years registration with the CVM.

To analyze the association between the variables and, thus, measure the direction of the relationship between them, the Pearson correlation coefficient was calculated (Table 3).

Table 3

Correlation Analysis

	Debasement (P_r)	Debasement (P_Lini)	Year	Number of participants	Min auction	CVM registration	Total Assets
Debasement (P_r)	1.00						
Debasement (P_Lini)	0.77***	1.00					
Year	0.04	0.11	1.00				

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Number of participants	0.60***	0.57***	0.13	1.00			
Auction minutes	0.17	0.13	-1.29	-0.06	1.00		
CVM registration	-0.35***	-0.48***	0.10	-0.31***	0.20*	1.00	
Total Assets (log)	-0.29**	-0.39***	-0.09	-0.32***	-0.07	0.59***	1.00

Note: With ***, ** and * significant at 1%, 5% and 10%, respectively

Among the findings in Table 3, it is highlighted that the increase in the number of participants in the auction causes greater variation between the estimated price and the contracted price in the auction, leading to the occurrence of Debasement. It is possible to see that debasement is also related to the variables CVM Registration, number of participants and Total Assets. These results are in line with the literature and as expected. The high correlation between the two debasement measures may be a sign that the results will not differ with a change in the way this aspect is measured.

The variables were tested using the necessary assumptions for the models: normality test (Shapiro-Wilk), homoscedasticity (Breusch-Pagan and White), model specification (Ramsey) and multicollinearity (VIF). It was found that the consistency assumptions of the OLS estimators presented statistically significant results, providing evidence about their adequacy.

Table 4 presents the variables and statistics generated by the regression model, with the debasement variable as the dependent variable.

Table 4

OLS Variable Debasement Regression Analysis

Variables	Debasement (P_r)		Debasement (P_Lini)	
	Coef.	t	Coef.	t
Year	0.002	0.21	0.015	1.47

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Number of participants	0.035	4.95***	0.029	4.50***
Auction minutes	0.002	2.71***	0.002	3.02**
Big Four	0.048	0.34	0.096	0.74
CVM registration	-0.008	-2.15**	-0.012	-3.52**
Previous firm participated	0.044	0.66	0.072	1.19
Previous firm won	-0.049	-0.82	-0.003	-0.05
Total Assets (log)	0.006	0.42	0.002	0.12
_cons	-4,662	-0.21	-29,956	-1.46
F		6.76***		8.48***
R²		0.39		0.52

Note: ***, ** and * significant at 1%, 5% and 10%, respectively

The estimated coefficient with a negative sign indicates that the variable is associated with the reduction of debasement of audit costs: lower variation between estimated price and contracted price, in the bidding process. The number of participants in the auction showed a positive and significant estimated coefficient at 1%, in line with the result of Pearson's correlation, associated with the increase in variation in the estimated price and contracted price of the auction. This observation corroborates the sense that the higher the level of competition in the auction, the greater the chances of debasement of the audit cost occurring. The other variable related to the competitiveness of the auction analyzed in the model was the duration of the auction (variable Auction minutes). The association of variables related to competition and competitiveness for debasement is in line with Auction Theory, as pointed out by the authors Vanzan and Avila (2008) and Blankley et al (2021): the greater the number of participants in the auction, the greater the chance of the Winner's Curse occurring. From the contractor's perspective and the foundations of electronic bidding for the acquisition of services and common goods, this phenomenon represents economics for public administration. However, pressure on audit fees is a constant concern for regulators of independent audit activity. The variable CVM Registration presented a negative coefficient, indicating that the longer period of registration with the CVM of the independent audit firm is

associated with a reduction in the variation in estimated price and contracted price in the auction. From this result, the auditor's experience can be related to the pricing of fees with less willingness by experienced auditors to the winner's curse. The result suggests that for each year of registration with the CVM, the Debasement of audit fees decreases by 0.8%. The fact that audit firms at the beginning of their activity and with a shorter CVM registration period are more willing to reduce their fees to win a new contract is consistent with research by DeAngelo (1981). The decision is based on commercial rationality, as these contracts serve as a springboard for obtaining technical credentials for work with greater specificity and, thus, greater future gains. The other variables analyzed in the model were not statistically significant.

The research result suggests, for the sample analyzed, that selection via electronic auction puts pressure on the independent auditors' decision-making process regarding their fees without considering the size factor of the company to be audited. Therefore, its price definition is not based on estimating the effort required to carry out the independent audit service. The result found is in line with the study by Hallman et al. (2023). For the authors, auditors underestimate the client's risk when establishing audit fees at more competitive values.
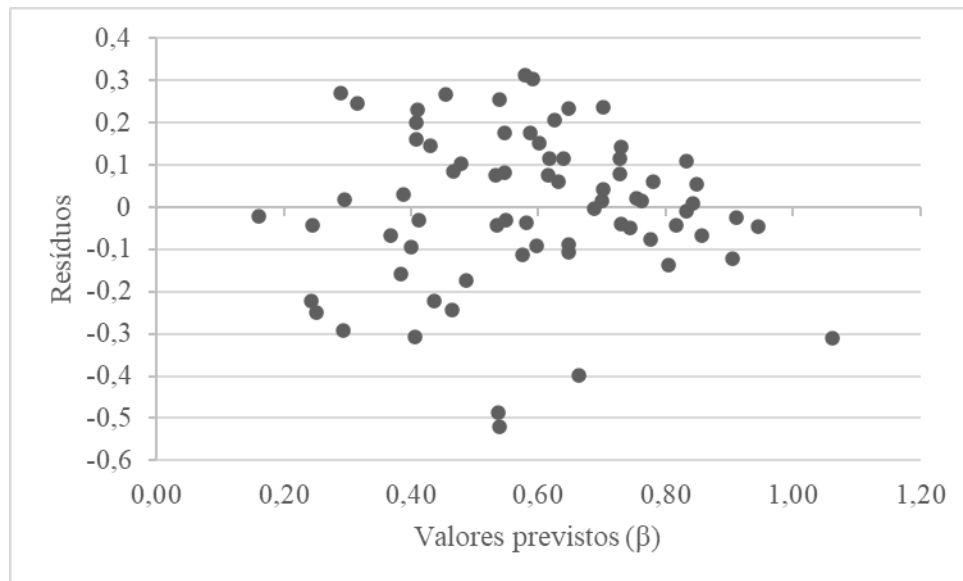
4.2 Results Discussion

4.2.1 *Document Analysis for Further Distances from the OLS Model*

From the analysis of residues through OLS regression, it is possible to verify the auctions that had effective results that were far from the predicted values. Figure 2 shows the distribution of auctions in relation to the predicted regression value (β) and residuals.

Figure 2

Residual debasement regression

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From Figure 2, the auctions that presented the greatest distances from point zero were evaluated (regression predicted value (β) x Debasement). The auction of Hemobrás, a state-owned company linked to the Ministry of Health in the production of blood-derived medicines, obtained through biotechnology to primarily serve the SUS, was held on July 22, 2019. The auction had the exclusive participation of companies as micro-enterprises and small company, totaling eleven auditing firms competing for the auction. The auction notice was published on July 10, 2019. The object described provides for the participation of the hired audit firm in twenty face-to-face meetings to meet the fiscal and administrative councils, the audit committee or the Company's General Meeting, in its headquarters in the Federal District, or in the Pernambuco branch, as required. This specification causes additional costs for the audit firm to fulfill the contract with travel and transfers, which may have led to a reduction in the competitiveness of bids between participants. The auction had an effective dispute between just two auditing firms. Due to the low competitiveness and willingness of participants to bid by reducing their prices, the auction lasted 14 minutes, considerably below the average of the data analyzed, of 46 minutes. The last auction bid was R$ 69,826.00, higher than the estimated price. However, the audit firm was disqualified. The second placed winner

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declared the last bid of R$ 69,860.90 and agreed to reduce the negotiated value to R$ 51,000.00. This company offered the initial proposal of R$ 80,000.00, representing a 36% reduction in relation to the initial proposal. The winning company had, then, four years of registration with the CVM and is located in the city of Recife/PE, where the notice provided for participation in the meetings. It was the same firm that carried out the audit in the previous year. However, for the previous year, the auction took place on June 12, 2018, with a winning bid of R$ 15,590.00, a debasement of 90%. The 2018 result led to the 2019 debasement.

The auction of ABGF, a state-owned company linked to the Ministry of Economy, was held on November 23, 2016 and included the participation of seven auditing firms. The number of competitors is below the average number of participants observed in the analyzed data. The auction time was 17 minutes, also below average. Of the seven competing companies, only one audit firm reduced its initial bid, and was declared the winner, with a value of R$ 168,500.00, demonstrating the lack of competitiveness. However, it was disqualified upon appeal due to failure to comply with the bidding notice. After calling the other participants, in the order of classification of the initial bids, five more firms were disqualified, leaving the last placed firm with an initial bid of R$ 800,000.00 and which agreed to negotiate the value to R$ 304,700.00.

The CDP auction was held on March 21, 2014. The auction was attended by eight auditing firms, the estimated value of the auction was R$ 245,280.00. The lowest initial bid was R$ 20,560.00, which was disqualified for not meeting the notice, and the highest initial bid was R$ 900,000.00. The auction lasted 26 minutes and only three auditing firms bid. The third-placed team was declared the winner, due to the disqualification of the first two placed, with a value of R$ 179,999.99, with its initial bid being R$ 900,000.00. This audit company has registered with the CVM for two years.

Regarding auctions with positive residues, data from INB, CEITEC and Caixa Econômica Federal stand out. The INB auction was held on March 25, 2020 and seven bidders participated in the auction. The estimated value of the bid was R$ 410,214.29, the highest initial bid was R$ 942,000.00 and the lowest initial bid was R$ 149,500.00. The auction lasted 54 minutes. The number of bids after the start of the auction totaled 164 offers. It is possible to identify from the bidding notice the expected extension of the contract for another two periods, of twelve months each, a condition that results in a signal for participants to guarantee future gains as a result of the contract renewal. It is also noteworthy that the auction took place at a time of uncertainty that was taking place in Brazil and the world due to the COVID-19 pandemic.

The CEITEC auction was held on July 9, 2019, with eleven firms and lasting 28 minutes. The estimated value of the bid was R$ 64,315.00 and the winning company had been registered with the CVM for nine years. The auditing firm is headquartered in the same city as CEITEC, which allows for lower operational costs to perform the service.

The Caixa Econômica Federal auction was held on March 26, 2010. Four auditing companies participated in the auction, three of which were Big Four. The estimated value of the bid is R$ 7,343,421.00 and the highest initial proposal is R$ 7,318,700. The dispute lasted 30 minutes and the winning proposal, from the same auditing company as the previous year, was R$ 3,250,000.00.

4.2.2 Regression Analysis Result Management and Debasement

Table 5 presents the variables and statistics generated by the regression model.

Table 5

OLS accruals regression analysis

Variables	Coef.	t

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$\delta1_{Recit}$	0.284	2.05**
$\delta2_{Despit}$	0.070	2.54**
$\delta3_{At.Imobit}$	-0.274	-0.38
constant	-0.154	-3.73***
F		3.12**
R²		0.12

Note: ***, ** and * significant at 1%, 5% and 10%, respectively

The results were significant at 5% for the variables that best represent the formation of Total Accruals (TA) of state-owned companies, positively influenced by operating revenues and expenses. However, no statistical significance was found in the variable involving fixed assets. The F statistic is significant at 5% and the results and signs are consistent with those found in the research by Martinez (2008).

The estimation of the total accruals model is necessary to find discretionary accruals (AD), a proxy used to describe earnings management. The AD was estimated by error, through the difference between the AT value and the value estimated from the implemented regression coefficients. Thus, the error found in the regression is the component that will be used for AD for each company.

To this end, the audit quality OLS regression was implemented, defined based on the dependent variable AD (results management) and the debasement of fees as the response variable. The Big Four variables, Registration with the CVM, Opinion were also included. These variables were used in order to capture the effect they have on earnings management practices. The Discretionary Accruals variable is not significantly correlated with the other variables (debasement, Audit Delay and time at the CVM). This may be a sign that it is not possible to find an expressive result in the regression model, as expected. The result of the OLS regression is shown in Table 6.

Table 6

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Effect OLS regression analysis (Debasement x Accruals)

Variables	Debasement (P_r)		Debasement (P_Lini)	
	Coef.	t	Coef.	t
Debasement (P_r)	-0.08	-1.06		
Debasement (P_Lini)			-0.06	-0.63
Audit Delay	0.00	0.2	0.00	0.2
Big Four	0.02	0.22	0.03	0.3
CVM registration	0.00	-0.19	0.00	-0.19
Opinion	0.02	0.53	0.02	0.50
Emphasis	-0.01	-0.31	-0.01	-0.24
_cons	0.20	2.63**	0.19	2.11**
F		0.93		0.98
R²		0.03		0.02

Note: ***, ** *and * significant at 1%, 5% and 10%, respectively*.

The regression result, for the independent variables that express debasement, did not show statistical significance. Regarding the control variables, involving determinants of the independent audit carried out on the financial statements of state-owned companies, there is also no statistical significance. The Mann-Whitney non-parametric test was also performed, dividing the sample based on the debasement median. The result also showed that there is no evidence that the degree of earnings management (Discretionary Accruals) is statistically different between the debasement conditions of independent audit fees. In other words, the Winner's Curse does not cause a loss in audit quality, when analyzed from the perspective of results-based management.

4.2.3 *Model without the Constant (Results-based management x Debasement)*

When exploring the research results, one of the tests carried out was to work with the relationship between the dependent variable, the debasement variable and the control variables, without the presence of the constant in the expression. It is important to highlight that there is controversy about the possibility of removing the constant in OLS models.

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Brooks (2002) considers that the presence of the constant is necessary so that the angular coefficient would be biased, in addition to making the values of the correlation coefficients meaningless. However, Gelman and Hill (2006) show an example where the absence of the constant term may be more interesting. In other words, this matter is not yet pacified. For this reason, despite having carried out the model calculation without the constant, it was decided to consider the results in a conservative manner, separately, to avoid questioning the values obtained. However, it is undeniable that this is a promising discussion.

In light of the above, table 8 presents the results of the OLS model, without the presence of the constant. It is possible to observe that the variables Debasement (P_Lini) and Audit Delay, which measures the distance between the date of the opinion in relation to the base date of the financial statements, are significant.

Table 8

OLS regression analysis (accruals x debasement) without the constant

Variables	Debasement (P_r)			Debasement (P_Lini)		
	Coef.	t		Coef.	t	t
Debasement (P_r)	0.07	1.23				
Debasement (P_Lini)				0.10	1.77	*
Audit Delay	0.00	1.93	*	0.00	1.57	
Big Four	0.02	0.18		0.03	0.33	
CVM registration	0.00	0.97		0.00	0.95	
Opinion	0.02	0.43		0.02	0.35	
Emphasis	0.00	-0.07		-0.01	-0.12	
F (p-value)		0	***		0	***
R²		0.49			0.5	

Note: ***, ** and * significant at 1%, 5% and 10%, respectively

5 CONCLUSIONS

The present study aimed to investigate the effect of the winner's curse on public procurement, auction modality, of independent auditing. Through the investigation of the determining factors for the Debasement of the fees of independent auditors of state-owned companies due to the auction contracting mechanism and the effects on the quality of the independent audit.

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The results obtained are in line with the theoretical basis regarding Auction Theory, in which the degree of competitiveness is a determining factor for bids; Furthermore, the greater the number of participants in an auction, the greater the chance of the Winner's Curse occurring. Other factors, such as the characteristics of the auditor, proved to be relevant.

With regard to tests regarding the impact of the occurrence of Debasement in relation to the quality of the audit carried out in these companies using results-based management as a proxy, the research hypothesis was statistically rejected to determine causality and correlation between the existence of Debasement and management of result. It is in line with international studies already carried out in the context of the existence of lowballing and audit quality, in which there was no indication of a significant association, the fact of reducing fees the independent auditor reduces their efforts in carrying out the audit and thus reducing the quality of the audit. independent audit.

Such evidence may indicate that the independent audit is not able to inhibit the effects of discretionary decisions in the preparation of financial statements, which causes relevant impacts on the quality of the accounting information of these companies. In this way, state-owned companies produce accounting information loaded with discretionary biases, consistent with studies already produced (Scalzer et al, 2017).

As an additional consequence, the independent auditor was unable to mitigate the practice of results-based management in the state-owned companies evaluated in this study. This raises questions about the effectiveness of the contracting model for this service.

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Winner's Curse and the Hiring of Independent Auditors by State Companies in Brazil

ABSTRACT

Objective: This research investigates the effect of the winner's curse on public hiring of independent audits.

Method: The study was quantitative, with 73 contracts via electronic procurement of state-owned companies between 2010 and 2020 for hiring independent audit firms. Data were analyzed using multiple linear regression and quantile regression.

Originality/Relevance: This is the first study conducted in Brazil using federal government electronic auction data to study the effect of the winner's curse.

Results: The results show that this type of contracting causes high competition among audit firms, increasing the variation between the estimated price and the contracted price, affecting fees, especially for initial audits. Using performance management as a proxy for audit quality, it was not possible to determine its influence. However, in the additional test, using OLS without the constant, the regression result indicates statistical significance.

Theoretical/Methodological contributions: The study used an available database to make a connection between the auction process that occurs in the federal public sector.

Social/Management contributions (optional): Elements have been obtained that raise doubts about the effectiveness of the electronic auction for contracting independent auditing services.

Keywords: Independent Auditing, Winner's Curse, Auditors' Fees.

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