Writing the Deal: Statistical Analysis of Brazilian Business Negotiations on Intangible Assets

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ABSTRACT

In times of coronavirus pandemic, and consequently, lockdowns, home office, social isolation, delta, and omicron variants, the development of writing negotiation skills are critical for success in business negotiations. These days, instant messaging and e-mail, two ubiquitous forms of electronic communication are used on a large scale, as an alternative to face-to-face negotiations. However, business asynchronous negotiations have their difficulty levels and pitfalls. This article addressed the challenges of asynchronous communication through the statistical analysis of N=1,400 Brazilian business negotiations on intangible assets. Key findings pointed out a strong, positive correlation between open and close value deals ($\rho = 0.939$, $p < 0.010$). The linear regression analysis showed significant non-parametric residuals. Moreover, the average between open and close values is 11.4 percent. We found evidence that anchoring is significant in business asynchronous negotiation on intangible assets. The conclusions are limited to the data set under investigation. The article provides scholars, negotiators, and practitioners with a perspective on the writing negotiation through e-mail or instant messaging.

Keywords: Business writing negotiations, intangible assets, anchoring effect.

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I. INTRODUCTION

In the present article, we found statistical significance in Brazilian asynchronous business negotiations on intangible assets, involving N=2,800 Brazilians from all five regions. Two parties received instructions to negotiate one issue in writing (acquisition price), via instant messaging, such as WhatsApp or Telegram, or Type I negotiation (Dias, 2020). The analysis suggested attention to challenges in business asynchronous negotiations such as (i) the anchoring effect, and how to (ii) structure business negotiations, to be addressed and further discussed in the following sections.

Business negotiations have attracted scholar attention in recent years (Dias, et al. 2015; Dias and Navarro, 2020, 2013; Dias and Lopes, 2020; Dias, M; Madureira, A; Lima, M; Mororó, C; Leite, A; Prates, W; Salvador, G; Araújo, H; Souza, A; Oliveira, M; Marques Filho, C., 2021; Dias and Lopes 2021; Dias, 2018; 2016); Dias, 2021, 2020, 2020b; 2019, 2018), among others. This study was designed for addressing business negotiations on intangible assets through writing communication. Other negotiations, such as negotiations involving third parties (Type III negotiation), should be investigated in additional studies.

Salacuse (2003) defined Negotiation as a "process of communication by which two or more persons seek to advance their interests through joint action." (p. 7) Moreover, Fisher, Ury & Patton (1981) reported negotiation as "a process of communicating back and forth to reach a joint decision." (p. 20). Asynchronous, is negotiation with a time delay between offers, through instant messaging or e-mail . In addition, according to Dias (2020), a negotiation can be categorized into four types: (i) Type I, two-parties, one issue; (ii) Type II, two-parties; multiple issues; (iii) Type III, multiple-parties, one issue – negotiation, and (iv) Type IV, multiple parties, multiple issues - negotiation, as depicted in Fig. 1.

Fig. 1. The Four-Type Negotiation Matrix. Source: Dias, 2020. Reprinted under permission.

Observe in Fig. 1 that the investigation is limited to Type I negotiation. Finally, intangible assets negotiation involve "variations of intellectual, structural, and relationship capital, emotional attachment to a tangible asset under Negotiation, such as an internet Uniform Resource Locator (URL), for instance." (Dias, 2020b, p.1,421). Moreover, two variables were investigated in the present research: (i) independent variable: open (OPEN) and (ii) dependent variable close (CLOSE) value deals.

In the present study, the following assumptions were considered, regarding the data set investigated: (i) the open value somehow influences the close value; (ii) an intangible asset is more difficult to be valued than a tangible asset. Therefore, OPEN is not a predictor for CLOSE; (iii) the samples (deals) are independent, i.e., the outcome of a given negotiation does not interfere with another negotiation. The negotiations were conducted separately with no mutual interference; (iv) the confidence interval is 99 percent.

Moreover, three research questions were addressed in this investigation, as follows: (i) is there statistical significance between OPEN and CLOSE values? (ii) Is it possible to predict a close value (dependent variable) from an initial value in mainly intangible assets business negotiation cases? Finally, (iii) does the anchoring effect influence the results? Finally, this article compiles the following sections: (i) Hypothesis; (ii) research methods and design: (iii) results and analysis; (iv) implications and research limitations, and (v) conclusion. In the next section, the research hypotheses are resented.

II. HYPOTHESIS

H₀: The close value (dependent variable) is not affected by the open value (independent variable) in the intangible assets business negotiations from the data set. In sum, the close value is not affected somehow by the open value.

Therefore, **H₀** =μOPEN=μCLOSE, or H₀ = μOPEN - μCLOSE = 0, where: μOPEN is the mean opening value, and μCLOSE is the mean close deal value.

Hₐ: The negotiation close value correlates to open value in the intangible assets business negotiations. In sum, there is a significant correlation between open and close values in the negotiations analyzed.

III. METHODS AND RESEARCH DESIGN

The present research follows a positivistic approach and deductive rationale. A series of statistical tests were applied to N=1,400 deals. The confidence interval adopted for this research is 99 percent (p< 0.010). A Type I role-play simulation was applied to 2,800 Brazilian business negotiators, from all five Brazilian regions. The sample (N=1,400) was randomly chosen from a data set of 8,000 deals, collected over the past decade of business negotiations. In total, 60 cohorts were investigated from January 2012 to December 2021. In total, N=1,400 intangible asset business negotiations cases were assigned to 2,800 participants. Every two participants received the same set of instructions. IBM SPSS 26 (Brazilian Portuguese version) was employed to analyze data. Regarding the ethnographic data, out of the

2,800 research subjects, 65 percent were male, 35 percent female, 72 percent in the middle to high-level management positions, and 30 percent occupied low-level management positions; 85 percent are employed, from which 80 percent Caucasians, 60 percent married, 40 percent single, divorced, or other; 62 percent were 25-35 years old, 23 percent above 35 years old. The negotiators had at least three years of business negotiation experience. All the participants are MBA students, taking day and night negotiation sessions, within and outside business hours.

The participants were told to read the instructions and to engage in the negotiation via instant messaging. After the negotiation was concluded, the participants should report (i) deal or no deal; (ii) the open value, and (iii) the close value. Finally, raw data was input into SPSS and further analyzed. The first test conducted was the normality test. Next, correlation and linear regression tests were applied to the data. The equations for the Shapiro-Wilk test is as follows:

$$W = \frac{\left\{\sum_{i=1}^{n} a_i \left(x_{(n-i+1):n} - x_{i:n}\right)\right\}^2}{\sum_{i=1}^{n} (x_i - \bar{x})_2},$$

The linear regression analysis equation is as follows:

$$Y = \beta 0 + \beta 1. Xi + \varepsilon$$

IV. RESULTS AND ANALYSIS

Table I illustrates the results of the Shapiro-Wilk normality test, due to the number of samples investigated (N>100):

TABLE I: NORMALITY TESTS.

Normality Tests						
Statistics		gl		Shapiro-Wilk		
0,179	1400		Sig.	Statistics	gl	Sig.
CLOSE			0,000	0,787	1400	0,000

a. Correlação de Significância de Lilliefors.
Source: SPSS 26.

Notice in Table I that p < 0.010 for both variables, resulting in non-parametric variables, i.e., the distribution of the results did not follow a normal distribution, as the dependent variable (CLOSE) depicted in the histogram illustrated in Fig. 2, as follows:
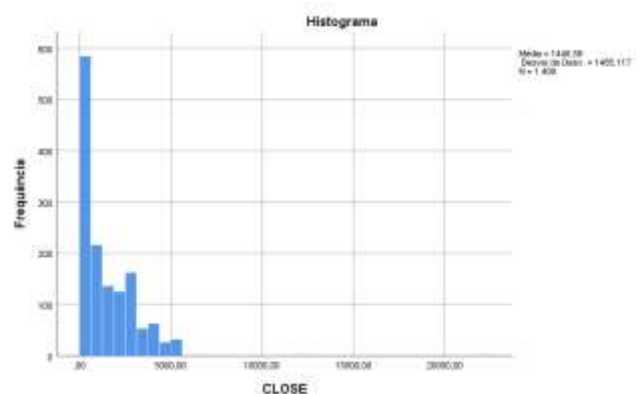

Fig. 2. Close values frequency. Source: SPSS 26.

The Shapiro-Wilk test revealed that the Pearson correlation test was not suitable to analyze the data. Therefore, a Spearman correlation test was conducted, as is depicted in Table II:

TABLE II: SPEARMAN CORRELATION TEST

Correlations

			OPEN	CLOSE
ρ Spearman	OPEN	Correlation Coefficient	1,000	0,939**
		Sig. (1 end)	.	0,000
		N	1400	1400
	CLOSE	Correlation Coefficient	0,939**	1,000
		Sig. (1 end)	0,000	.
		N	1400	1400

**.The correlation is significant at level 0.01 (1 extremity).
Source: SPSS 26

Observe in Table II the Spearman correlation between OPEN and CLOSE variables. Also, that $R^2 = .88$. Next, a scatter plot is shown in Fig. 3, as follows:

Fig. 3. Scatter plot. Source: SPSS 26.

Notice in Fig. 3 the data dispersion, diagonally distributed. The Spearman correlation showed a strong, positive correlation between OPEN and CLOSE variables ($\rho = 0.939$; $p < 0.10$), i.e., if the OPEN value increases, the CLOSE increases too, and the variables are strongly connected. Furthermore, $p < 0.10$ also indicates that the null hypothesis is rejected, as illustrated in Table 3, as follows:

TABLE III: HYPOTHESIS TEST

Hypothesis test report

	Null hypothesis	Test	Sig.	Decision
1	The distribution between OPEN and CLOSE is equal to 0.	Related Samples of Wilcoxon Signed Rank Test	0,000	Reject the Null hypothesis.

Asymptotic significance is displayed. The significance level is,010.
Source: SPSS 26.

The linear regression test determined if there would be a predictive relationship between the dependent and independent variables resulting in the ANOVA, and coefficients test, depicted in Tables IV and V:

TABLE IV:ANOVA

ANOVA^a

Model		Sum of Squares	Df	Middle Square	Z	Sig.
1	Regression	1590496158,807	1	1590496158,807	1487,202	0,000^b
	Residue	1495098815,429	1398	1069455,519		
	Total	3085594974,236	1399			

a. Dependent Variable: CLOSE
b. Predictors: (Constant), OPEN
Source: SPSS 26.

TABLE V: LINEAR REGRESSION COEFFICIENTS

Coefficients^a

Model		Non standardized coefficients		standardized coefficients	t	Sig.
		B	Error	Beta		
1	(Constant)	535,764	36,355		14,737	0,000
	OPEN	0,711	0,018	0,718	38,564	0,000

a. Dependent variable: CLOSE.
Source: SPSS 26.

However, regarding the investigation of the residuals statistic for the sample investigated, Table VI depicts the interval between residual errors is more significant than -3 to +3.

TABLE VI: RESIDUAL STATISTICS

Residuals Statistic^a

	Min	Max	Average	Std Dev	N
Anticipated value	548,5568	21857,0781	1446,5811	1066,24610	1400
Residue Error	-17357,07812	19474,24609	0,00000	1033,77516	1400
Anticipated value	-0,842	19,142	0,000	1,000	1400
Error Residue	-16,784	18,831	0,000	1,000	1400

a. Variável Dependente: CLOSE.
Source: SPSS 26.

Therefore, the residuals are not normally distributed, and there is no causal relationship between CLOSE and OPEN variables in the data set studied.

However, despite the absence of a causal relationship between variables, i.e., a given open value does not predict a close amount in this sample, the comparison of the mean revealed an interesting result, displayed in Table 7:

TABLE VII: MEANS COMPARISON

Report

GROUP		CLOSE	OPEN
HUNDREDS THOUSANDS Total	Mean	**405,6678**	**372,7282**
	N	694	694
	Std Error	474,84720	362,45922
	Mean	36,00	18,00
	N	4500,00	3500,00
	Std Error	4464,00	3482,00
	Mean	49,6%	49,6%
	N	**2469,8018**	**2174,9414**
HUNDREDS THOUSANDS	Std Error	706	706
	Mean	1428,29545	1650,73155
	N	150,00	100,00
	Std Error	22000,00	30000,00
	Mean	21850,00	29900,00
	N	50,4%	50,4%
	Std Error	**1446,5811**	**1281,5585**
Total HUNDREDS	Mean	1400	1400
	N	1485,11677	1500,25389
	Std Error	36,00	18,00
	Mean	22000,00	30000,00
	N	21964,00	29982,00
	Std Error	100,0%	100,0%

Source: SPSS 26

Observe in Table VII that the results were arranged in two

distinct groups, according to the open and value deals for each negotiation: (i) HUNDREDS, and (ii) THOUSANDS, of BRL.

V. IMPLICATIONS AND RESEARCH LIMITATIONS

The conclusions have implications in several fields of study: (i) contract negotiations (Cunha, Dias, 2021); (ii) Civil Engineering Works Negotiation Dias, M.; Bezerra, A, Sousa, J.C., Costa, H.; Schmitz, F., Santos, C; Moreira, A.; Mattos, S.; Neves, M.; Filho, N.; Filho, C.C., 2021); (iii) Credit cooperative negotiations (Dias and Teles, 2018); (iv) intangible assets negotiation (Dias, 2020b), among others. wThe study was designed to address asynchronous Brazilian business negotiations on intangible assets (Type I negotiation). In other countries, types of negotiation should be investigated in additional studies or in separate. Other countries or scenarios may differ in results. The conclusions are, thus, limited to the dataset investigated (N=1,400 negotiations).

VI. CONCLUSION

In this section, the answers to the research questions are presented and discussed, as follows:

(i) *Is there any causal relationship between OPEN and CLOSE values?* The answer is yes. The analysis of the results of the Spearman Correlation test indicated a positive, strong correlation between OPEN and CLOSE variables ($\rho = 0,939$, $p < 0.10$). Additionally, the null hypothesis is rejected. Therefore, the open value does influence somehow the close value, as illustrated in Table 1.

(ii) *Is it possible to predict a close value (dependent variable) from an initial value in mainly intangible assets business negotiation cases?* The answer is no. The residuals (outliers) are not normally distributed in this sample, explained by the number of atypical negotiation results, as depicted in Figure 10.

(iii) *Does the anchoring effect influence the results?* The answer is yes. According to Ariely (2008), Bazerman and Moore (2009), Kahneman and Tversky (1982), the decision-making process is affected by the desire to win and loss aversion, affecting somehow the initial offer or bid, in the negotiations described.

In conclusion, the initial offer (OPEN) exerts an attraction to the close deal (CLOSE). Note in Figure 11 in the HUNDREDS group, that OPEN is 8.11 percent distant from CLOSE values. In the THOUSANDS group, OPEN is 11.2 percent distant from CLOSE values. On average, OPEN is 11.4 percent distant from CLOSE values. In the next sections, the implications and research limitations are disclosed. In sum, we found statistical relevance between OPEN and CLOSE values that cannot be attributed to chance ($p < 0.010$).

Finally, the OPEN and CLOSE values (BRL), i.e., the price of the intangible asset, answers for 88.17 percent of the phenomenon under investigation ($R^2 = 0.8817$). Therefore, the asset price negotiations proved to be crucial for the dataset investigated.

VII. FUTURE RESEARCH

This study investigated Brazilian business negotiations on intangible assets. For future research, we encourage the qualitative investigation on the participants to address the rationale behind their price choices, as well as the reasons to be the first bidder. We also encourage the investigation of other Types of negotiation (Dias, 2020), such as Type II, III, and IV (see Fig. 1). The investigation of business asynchronous negotiations in other countries is finally recommended.

CONFLICT OF INTEREST

The authors declare that they do not have any conflict of interest.

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