

The effect of negotiations frequency on the vehicles price in public sector in Indonesia

Febrita Sidabalok^{α*}, Kyohei Yamada^β

* Email: fsidabalok@gmail.com

^α LKPP, Komplek Rasuna Epicentrum,
Jl. Epicentrum Tengah Lot 11 B,
Jakarta Selatan, DKI Jakarta – 12940

^β Rikkyo University, 3 Chome-34-1
Nishiikebukuro, Toshima City, Tokyo
171-8501

Riwayat artikel:

- Diterima 18 Oktober 2019
- Direvisi 11 Agustus 2020
- Disetujui 24 Agustus 2020
- Tersedia 12 November 2020

Abstract

E-Purchasing systems allow buyers and sellers to communicate directly and to negotiate. A relatively recent addition to public procurement practice in Indonesia, this research investigates how negotiation affects transacted price, particularly in the vehicle commodity. More than 30,000 transactions were examined; transactions consisted of central government purchasing organizations and the local government level. Statistical analysis involved Ordinary Least Square (OLS) and Multinomial Logit regression. Findings reveal that more frequent negotiations lead to a lower final price and that some government buyer organizations experience a more significant impact of negotiation than others. We discuss implications for Indonesian government policies and future research.

Keywords:

public procurement, electronic purchasing, communication, negotiations, multinomial logit, vehicle transaction

JEL Classification :

H50, H57, D83, H76

1. INTRODUCTION

Electronic procurement is introduced as a transaction medium, typically to bring improvement and advantages over traditional procurement. Muffatto & Payaro (2004) reveal several advantages from companies that implement electronic procurement, such as simpler processes, better productivity, and efficiency.

Moreover, faster and more economical than arranging face-to-face contact, this method enables companies to communicate with their suppliers, buyers, and customers. For example, Cannon & Homburg (2001) find that more frequent communication between buyers and sellers can reduce acquisition costs. Buyers and sellers can discuss various issues, for example, technical clarification, delivery time, and price negotiation. Having this facility increases the opportunity to negotiate substantially. A recent study by Jindal & Newberry (2018) highlights the benefit of price negotiation in the retail home-appliance market. Comparing transactions between those who bargained and those who bought on a fixed price, they found evidence to suggest that bargaining is the dominant strategy for most consumers. It is also owing to a perceived favorable cost-benefit analysis of bargaining; consumers generally anticipated that the cost of bargaining was lower than any potential benefit achieved from bargaining. As for fixed-price, this was not only related to reduced retailer profit but also decreased consumer surplus. Considering the above findings, increased negotiation is expected to be associated with a reduced price.

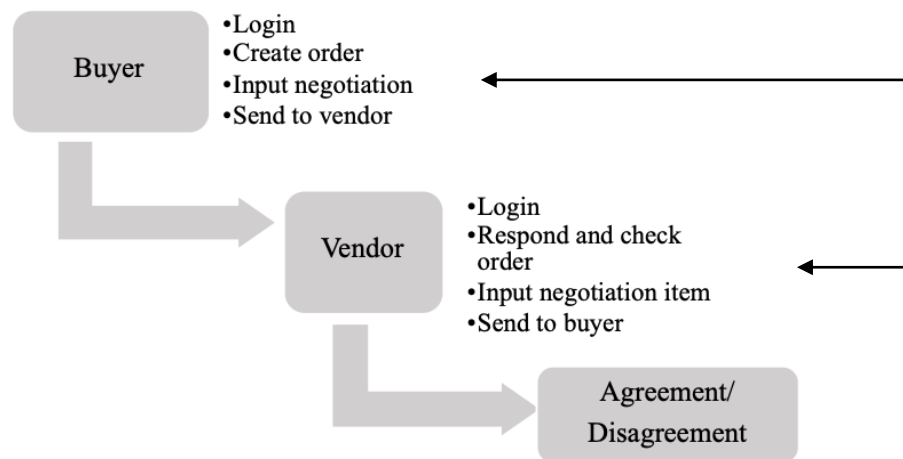
Negotiations not only occurs in business-to-consumer or business-to-business transactions process but also at the government level. The necessity of conducting negotiations in public procurement is highlighted by Harney (1992), who notes that each party competes for their own interest in any market situation. Observing that sellers aim to maximize profit while government purchasers want the best quality service at the lowest price, Harney calls for government purchasers to negotiate on items such as hourly rate, unit price, contract terms and conditions, and contract type.

Looking at the value of goods and services purchased by government bodies, public procurement accounts for more than 18% of the total world GDP (Auriol, 2006). As released by the Ministry of Finance, the Indonesian government's spending on goods and services accounts for around 14% of the national budget. In 2016 and 2017, the figure was IDR 323 billion (15.46% of the national budget), and IDR 296 billion (14.24% of the national budget), respectively. While there was a decline from 2016 to 2017, it increased again to IDR 320 billion (14.41% of the national budget) in 2018.

Considering that this represents a significant amount of public spending, this must be well-managed, starting from planning, budgeting, purchasing, monitoring, and evaluating. It is essential that public officials conduct procurement in an effective, efficient, and transparent way. E-Procurement has been introduced for this reason. E-Procurement is a comprehensive and systematic process that enables government procurement activities such as contracting and purchasing goods and services using IT systems. E-procurement tools include electronic ordering, purchasing cards, reverse auction, and automatic accounting systems (Harris, R. S., & Abramson, 2003).

Indonesia has utilized an e-procurement system at the central and local government level since 2007; this was by the issue of Presidential Decree 106 Year 2007. In its developing stages, e-procurement has e-tendering and e-purchasing features. This paper's focus is e-purchasing, in which there is a communication feature that allows buyer and seller negotiation. Figure 1.1 illustrates the flow of negotiation in the system, depicting the ease of this form of negotiation over the traditional face-to-face meeting.

Figure 1. 1. E-Purchasing Stages



Currently, 41 commodities can be purchased through this e-purchasing system (e-katalog portal, 2018). The scope of the present investigation has been limited to vehicle commodities. This scope is for their negotiable price, wide-use, and frequent purchasing by the government. Focus is the extent to which negotiation frequency can affect the final price of vehicle transactions between government buyers and private companies as sellers. Transactions from 2015 to 2017 are considered in this research; a software update in 2015 meant that the e-Purchasing platform utilized one, continuous software version, which provided a consistent data structure that lends itself to analysis.

Research on the impact of communication between buyers and sellers has primarily focused on the private sector. Some research attention has been given to the impact of buyer-seller communication. Cannon & Homburg (2001) focuses on manufacturing firms in the chemical, mechanical, and electrical industries in the context of manufacturing firms. On the other hand, Cai & Jun (2008) conduct a similar study in Shanghai, China, for industrial plastics, adhesive tape, lighting products, textile, and telecommunication products. Experimental work by Valley et al. (1998) also adopted the private sector scenarios on how communication affected the efficiency and distribution of outcomes. Therefore, the present study attends to a considerable gap in the literature by focusing on the impact of negotiation in the public sector. The dataset used here represents another contribution of this study, as each unit of analysis of each transaction is available for study, including a clear initial and final price, which clearly shows any price change.

The research objective is to examine the effect of negotiation frequency on the sale price of vehicles purchased by the Indonesian government through an electronic purchasing platform. Statistical regression is used to analyze transactions overall and government-level (i.e., central government compared to local government).

2. LITERATURE REVIEW

Public e-procurement is considered to facilitate an efficient, transparent, and less bureaucratic marketplace, encouraging positive buyer-supplier relationships (Costa, Arantes, & Tavares, 2013). In addition, government institutions' e-procurement adoption promotes transparency, and as transactions between contractors and state agencies become public, the administrative cost is reduced, further improving the procurement process. e-Procurement can, therefore, reduce purchasing prices by more efficient operation and through a larger pool of potential contractors (Singer et al., 2009). Moreover, in 2004 (Muffatto & Payaro, 2004)

also emphasize the opportunity to share information and knowledge as a major benefit of e-procurement.

E-Procurement is a web-based system covering each purchasing stage, selecting, sourcing, negotiating, ordering, receiving, and reviewing (Figure 2.1). There is evidence that e-procurement systems can affect not only total acquisition cost but also impact organizational characteristics and governance structures, direct system specifications, and alter implementation management (Croom & Brandon-Jones, 2007). Similar functions of e-procurement, also mentioned by Chang, Tsai, & Hsu (2013) are, e-design, e-sourcing, e-negotiation, and e-evaluation; e-negotiation in their context refers to the contract agreement conducted through technology. In their public sector e-procurement study, Croom & Brandon-Jones (2007) found that sale prices reduced owing to increased transparency, compliance, management information, demand aggregation, and increased influence from negotiations. Therefore, negotiation opportunity may lead to a lower final purchasing value than achieved through an e-procurement system alone.

Figure 2. 1. E-Procurement Stages



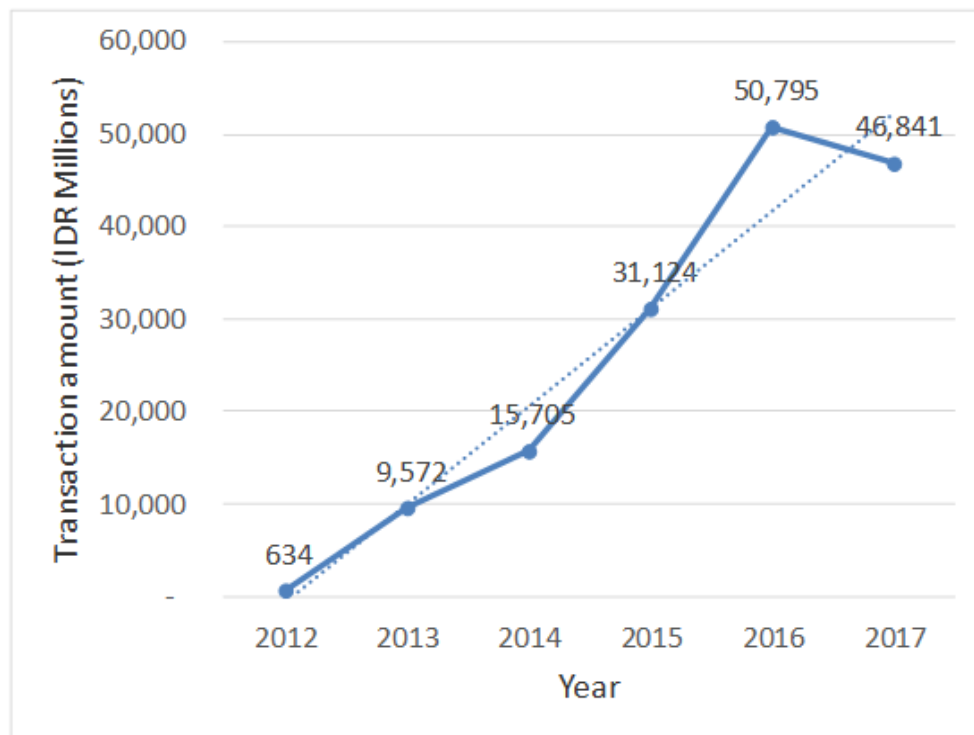
Other benefits of e-procurement are expected to include a greater variety of vendor options, more efficient and standardized procedures, less paperwork, reduced ordering time, and easier control and monitoring of budget spending (Reddick, 2004). Croom (2000) finds four distinct advantages of e-procurement: (i) reduced procurement process cost; (ii) greater visibility on expenditure control; (iii) increased control in procurement; and (iv) increased ability to manage suppliers. Due to these advantages, many governments have adopted electronic procurement (e-procurement). These institutions are expected to promote the use of the internet across industries; to promote transparency, as transactions between contractors and State become public; to reduce administrative cost by improving the procurement process, and to reduce purchasing prices due to more efficient operation and to a larger number of potential contractors (Singer et al., 2009).

Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah (LKPP) or the National Public Procurement Agency (NPPA) is tasked with Indonesia's procurement regulation. This task includes developing a public e-procurement system, which consists of e-tendering and e-purchasing. A key objective of NPPA is to shift the majority of national procurement from e-Tendering to e-Purchasing; increased transaction values recorded by the e-Purchasing system since its implementation in 2012 indicates that it is achieving this goal. Figure 2.2. illustrates increased transaction records (solid line) and the transaction trend (dashed line).

Given that this system is used at all levels of government, it would be interesting to examine the extent to which different government levels garner different results from using this system. For example, the Indonesian government is divided into central and local government; there are ministries and agencies in the central government, while local government is divided into provinces, cities, and regency's administration. Should different outcomes be evident, it could affect purchasers' motivation and/or their capability. Prud'homme (1995) argues that officers in the central government have higher capacities than those of the local government. This view is due to a more promising career path, less political dynamic, and more promotion possibilities. Considering this argument, an additional aim of this study will be to expose whether the purchasing officers' different capabilities affect

negotiation results. This aim will be achieved by comparing negotiation results between central and local government.

Figure 2. 2. E-Purchasing Transaction History



Source: National Public Procurement Agency

Negotiation is a form of communication to pursue a reduced cost of goods or services or achieve another agreement condition between the buyer and seller (Weigand et al., 2003). Notable for this research's public sector focus, negotiation in the public sector has distinct driving factors from private-sector negotiation. Ahadzi & Bowles (2004) explored this point in their study on the negotiation phase in a Public-Private Partnership (PPP) procurement project using multi-criteria decision theory. Their research revealed that important negotiation factors for the public sector were open and frank communication, willingness to commit to earlier negotiated terms, and the ability to establish clear evaluation criteria in bidding proposals. Meanwhile, the private sector valued previous experience in PPP procurement, consortium experience of previously working together as a team, and the ability to sensitize public opinion on a project effectively. However, in their paper, there is no explanation of formulating the characteristic attributes. Other studies by Heinrich (2012); Klabi, Mellouli, & Rekik (2013) discussed communication while negotiating as a vital part of deducing a vendor's reputation.

Similarly, other studies note the positive impact of communication on the buyer-seller relationship. For example, Cai & Jun (2008) argue that communication increases a bidder's probability of winning, and trading partners who exchange information frequently are more likely to have better purchasing performance on the buying side. On the contrary, a study by Boehm (2006) reveals that corruption can arise during contract negotiations, renegotiations, and implementation.

Earlier studies have used frequency as a dimension for measuring communication. Mohr & Nevin (1990) measured communication as frequency, direction, modality, and content; Mohr & Sohi (1995) considered communication as frequency, bidirectionality, and formality; Cannon & Homburg (2001) and Cai & Jun (2008) also included frequency as a measured aspect of communication. The studies mentioned above were conducted in the private sector;

therefore, the present study will make a unique contribution to the literature by measuring communication in the public sector.

Several hypotheses were formulated from the above discussion. First, that more frequent negotiating will be associated with a decrease in the final price. This decrease is because with more negotiation, there is an increased opportunity to convey dissatisfaction with the proposed price and increased the opportunity to change the price (reduce the price).

Hypothesis 1.1: The more frequent negotiations lead to a decrease in the final price.

Hypothesis 1.2: Transactions with more frequent negotiations will be associated with a higher probability of reduced final sale price than transactions with less frequent negotiations.

Second, not only the quantity but also the quality of negotiations might affect the final sale price. Negotiation quality may depend on the capacity of civil servants as the purchasers. On average, central government officials seem more capable than civil servants at the subnational level (Prud'homme, 1995). Therefore, we expect central government negotiations to reduce the final sale price more effectively than negotiations conducted by local government officials.

Hypothesis 2.1: The negative impact of the frequency of negotiations on the final price is greater in magnitude among transactions by the central government than among those by local governments.

Hypothesis 2.2: The positive impact of the frequency of negotiations on the probability of the price decline is greater in magnitude among transactions by the central government than among those by local governments.

3. METHODOLOGY

To examine the effect of negotiation frequency on the final price of vehicles purchased by the government, this study used transaction data of vehicle purchasing activities by the Indonesian government from 2015 to 2017. Data were retrieved from the National Public Procurement Agency (NPPA). The observation unit is 'transactions'; this includes information on the buyer and seller's identities, the number of negotiations, the motor vehicle purchased, and other details. The detailed content of the communications was not available from the data. To obtain the number of negotiations for each transaction, we collapsed the data at the transaction level, which gave us a total of 42,851 observations. Some data were incomplete or missing, and those observations were omitted from the analysis. It should be noted that only transactions recorded as successful, indicated by a sale agreement, were included in the analysis.

The impact of negotiation frequency was measured with two dependent variables. The first was the final price of the vehicle (*Final price (log)*), and the second was a categorical variable indicating whether the final price was different from the initial price (*Price changing category*). The following is a description of these variables.

Final price (log): This is the logarithm of the final price of the vehicle.

Price changing category: This is the difference between the final price and the initial price; it is categorized into three groups: the final price is lower than the initial price proposed in the first round of negotiations (price decreased), the final price is the same as the initial price (price same), the final price is higher than the initial price (price increased).

The key independent variable is negotiation frequency. Control variables include the number of vehicles, the buyer's organization, the vehicle's initial price, the vehicle type, and the manufacture of the vehicle. The following are descriptions of these independent variables.

Frequency of negotiations: This is the number of negotiations per transaction. Measuring communication by the number of negotiation frequencies resembled the method used by Cannon & Homburg (2001). However, they divided communication into face-to-face,

telephone, and written communication. As this paper is working on an internet-based electronic negotiation system, communication type refers to written communication only. We utilized four categories: no negotiation (symbolized as 0), one negotiation (symbolized as 1), two negotiations (symbolized as 2), and three or more negotiations (symbolized as 3).

The number of vehicles: This is the quantity of vehicles purchased by government institutions in one transaction. We included this variable to ascertain the extent to which purchase quantity could also affect the final sale price.

Buyer organization: This is the type of government organization that purchased the vehicle. The government organizations examined in this study are regency, city, province, ministry, and agency, as they are the institutions obliged to use e-purchasing. We have included this variable to investigate which buyer organization's negotiations have a more significant impact.

Initial price: This is the initial price of a vehicle proposed by the vendor in the first negotiation.

Type of vehicle: The type of vehicle purchased by the government. The dataset limited this to 12 categories. Five were included in this research; the categories with the highest transaction records were selected: car, motorcycle, truck, ambulance, and bus. This control variable indicated the relationship between the type of vehicle and the final price changing. The type of product was also one of the control variables used in Cannon & Homburg's (2001) research. They state that the type of product could influence a customer's costs and, therefore, their future purchase intentions.

Vehicle manufacture: We controlled for the vehicle models distributed throughout the transactions. We selected Toyota, Yamaha, Honda, Suzuki, Mitsubishi, Isuzu, Viar, and Hino, as they were the leading brands in the dataset. We aim to investigate the relationship between the brand and the probability of the final sale price changing. Table 3.1. describes the variables.

Table 3. 1. Summary Statistics of the Variables

Quantitative Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Final price (in millions of Rp)	42,848	221	193	1,180	0	226,000
Initial price (in millions of Rp)	41,463	217	193	460	0	58,300
Quantity	42,848	3.607029	1	15.93911	1	1,200
Categorical Variable	Frequency	Percentage				
Price change						
Decreased	6,162	14.38				
No change	34,842	81.31				
Increased	1,847	4.31				
	42,851	100				
Categorical Variable	Frequency	Percentage				
Frequency of negotiation						
0	30,522	71.23				
1	9,594	22.39				
2	1,816	4.24				
3	919	2.14				
	42,851	100				
Categorical Variable	Frequency	Percentage				
Organization						
Local-Owned Enterprises	5	0.01				
State-Owned Enterprises	3	0.01				
Regency	23,528	55.43				
Ministry	7,467	17.59				
City	6,268	14.77				
Others	2	0				
Agency	1,281	3.02				
Province	3,893	9.17				
	42,447	100				

Source: National Public Procurement Agency, 2017

3.2. Identification Strategy

Ordinary Least Square (OLS) regression was used to examine the relationship between negotiation and final price. The basic regression equation as follows:

$$\log_final = \beta_0 + \beta_1 X + \beta_2 \log_initial + \beta_3 \log_quantity + \epsilon \quad (1)$$

where *final* is final price; *X* is the category of the number of negotiations; *initial* is the initial price; and *quantity* refers to the number of vehicles purchased; ϵ indicates the error term. Applying frequency to measure communication is in line with earlier studies (Cai & Jun, 2008; Cannon & Homburg, 2001; Mohr & Sohi, 1995; Mohr & Nevin, 1990). The dependent variable is the final price because other transaction components heavily influenced it and it is a measurable output. Logarithm number is used for quantitative variables to distribute the data normally. Besides observing the final price and negotiation frequency relation, this paper uses the negotiation outcome as an alternative dependent variable. Since this is a categorical variable with no ranking or order, the multinomial logit model (MLM) was used (Gujarati 2004). The multinomial model is defined in equation (2) below, which identifies a model with the probabilities of the different outcomes, $j = 1, \dots, M$ (Borooah, 2002):

$$\Pr(Y_i = m) = \frac{\exp(Zim)}{\sum_{j=1}^M \exp(Zij)} \quad (2)$$

In MLM analysis, if variable *Y* has *j* categories, then the model describes each predictor's effect with the $j - 1$ coefficient. This analysis also includes an interpretation of the relationship between independent variables and the dependent variable in an MLM by calculating and plotting predicted probabilities.

Plotting the predicted probabilities provides a quick and informative way of showing the relationship between a selected predictor and the predicted probabilities of the various alternatives (Wulff, 2015). Given that this study has three outcomes, 1 (price decreased), 2 (no price changing), 3 (price increased), predicted probabilities in MLM follow the below the formula:

$$p_{ij} = \Pr(y_i = j | x_i) = \frac{\exp(x_i' \beta_j)}{\sum_{j=1}^3 \exp(x_i' \beta_j)} \quad (3)$$

the probability of i^{th} transaction that will have price outcome j ($j= 1, 2, 3$), x_i is the regressor, β_j is the coefficient vector, and contains the intercept β_{0j} and the slope coefficients β_{kj} (Wulff, 2015). Both OLS and MLM regressions were calibrated using the Stata program.

4. RESULT AND DISCUSSION

This section presents the estimation results of OLS and multinomial logit regression analysis. Table 4.1. reports the OLS outcomes, in which the dependent variable is the *final price* (*log*). Figure 4.1 visualizes the coefficient on the key independent variable to facilitate comparison across models. The multinomial logit regression results are presented in Table 4.2 and predicted probabilities are reported in Figure 4.2 to facilitate interpretation. For both OLS and multinomial logit regressions, we report six models – a model for the analyses using all the observations and five models that report the results of negotiation frequency on the outcome variables for five groups of buyer organizations separately – regency (kabupaten), city (kota), province, ministry, and agency.

Table 4. 1. OLS Regression Result

	Dependent Variable: Final Price (Rupiah, log)					
	All	Regency (Kabupaten)	City (Kota)	Province	Ministry	Agency
Negotiation Frequency	-0.00188*** (0,000)	-0.00294*** (0,001)	-0.000687** (0,000)	-0.00167*** (0,000)	0,000416 (0,001)	-0.00483*** (0,001)
Initial Price (Rupiah, log)	1.000*** (0,001)	0.998*** (0,002)	1.000*** (0,001)	1.000*** (0,001)	1.004*** (0,002)	0.993*** (0,002)
Quantity of Purchase (log)	-0,000409 (0,000)	-0,000289 (0,001)	0,0000217 (0,000)	-0.000564* (0,000)	-0.00124** (0,001)	-0.00154* (0,001)
Other Control Variables						
Vehicle Type	Included	Included	Included	Included	Included	Included
Manufacturer	Included	Included	Included	Included	Included	Included
Purchaser's Institution	Included	Not included	Not included	Not included	Not included	Not included
Constant	0,00974 (0,020)	0,0369 (0,034)	-0,00421 (0,012)	-0,00956 (0,015)	-0.0840*** (0,031)	0.142*** (0,046)
Observations	36342	20689	5073	3282	6120	1178
R-squared	1,00	1,00	1,00	1,00	1,00	1,00

Figure 4. 2. The Coefficient on the Negotiation Variable

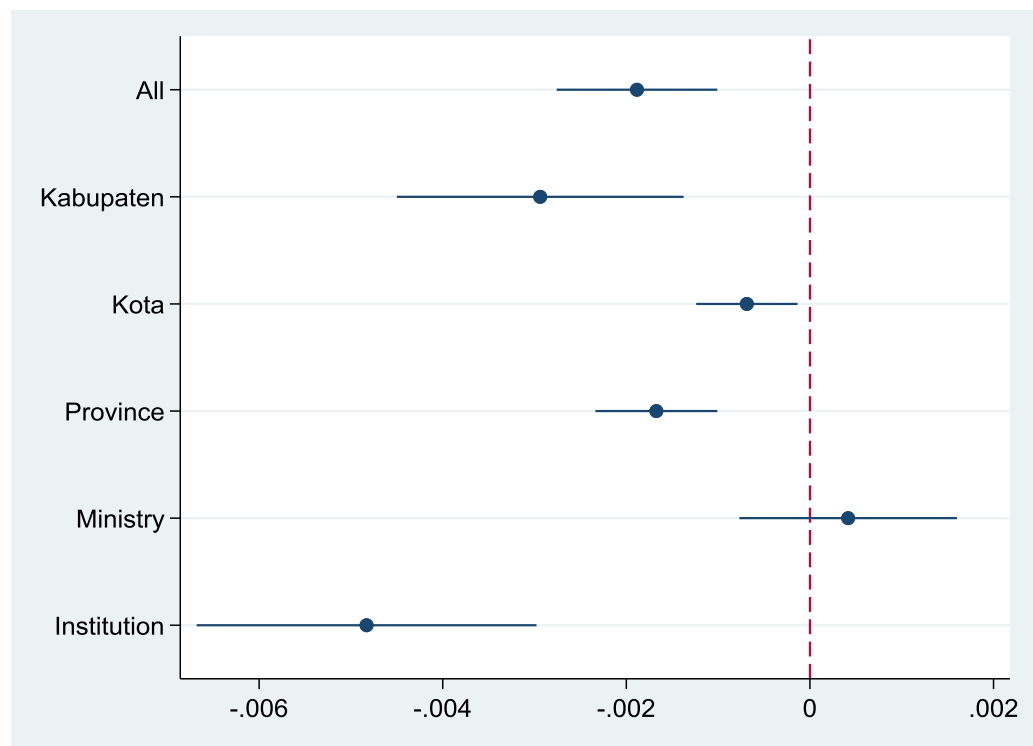


Table 4.1. shows that the key independent variable, negotiation frequency, negatively affects the final price. The coefficient is negative and statistically significant in the model in which all the observations are included. In addition, when the analysis is carried out for subgroups, the impact is negative for regencies (Model 2), cities (Model 3), provinces (Model 4), and agencies (Model 6), while the coefficient is not statistically significant for ministries. This result means that the higher frequency of negotiations for subnational governments and agencies is associated with a lower purchase price.

To discuss control variables, the initial price is found to be a significant factor across all government institutions. Moreover, this variable has a positive coefficient, which is plausible.

On the other hand, the quantity variable has a negative and significant effect on three buyer organizations (provinces, agencies, and ministries) but not in the other two.

Referring to the control variables, in the product category section, ‘truck’ was the omitted variable, while the other products were motorcycle, car, bus, and ambulance. Considering government institutions, the coefficients and significance vary. At the regency level, ambulance is the only significant variable and indicates that it has a lower final price compared to the truck. The city presents the same result as regency, along with the car. For the provinces, bus and motorcycle have a positive coefficient and obtained statistical significance. This result indicates that both products have higher final prices than trucks. At the ministry level, motorcycles and cars obtained significance, and the coefficient suggests that their final price is also likely to be higher than trucks. Lastly, the government agency variable reveals motorcycle and ambulance as significant products and specifies that motorcycles and ambulances have a lower final price compared to trucks.

With respect to the product manufacturer control variable, the omitted variable was Toyota, and the remaining were Yamaha, Honda, Suzuki, Mitsubishi, Isuzu, Viar, and Hino. Where all observations were included, only Isuzu obtained significance, with a higher final price than Toyota. Next, all other manufacturers obtained significance in the city column, and the final sale price for all other manufacturers was less than Toyota, except for Isuzu.

Table 4. 3. Multinomial Logit Result

	All observations		Regency		City		Province		Ministry		Agency	
	Price decreased	Price increased	Price decreased	Price increased	Price decreased	Price increased	Price decreased	Price increased	Price decreased	Price increased	Price decreased	Price increased
Negotiation Frequency	1.026*** (0,022)	0.971*** (0,058)	1.099*** (0,032)	1.017*** (0,087)	1.056*** (0,058)	1.389*** (0,201)	1.073*** (0,068)	0.716*** (0,170)	0.871*** (0,047)	1.021*** (0,116)	0.902*** (0,107)	0.595** (0,239)
Initial Price (Rupiah, log)	-0.288*** (0,055)	-0,0751 (0,181)	-0.563*** (0,079)	0,00962 (0,264)	-0,0852 (0,138)	-0,655 (0,791)	0,181 (0,169)	-0,191 (0,501)	-0,0996 (0,132)	0,759* (0,424)	-0,412 (0,275)	-1,919*** (0,651)
Quantity of Purchase (log)	0.267*** (0,021)	0.232*** (0,063)	0.177*** (0,030)	0.237*** (0,092)	0.361*** (0,054)	-0,0993 (0,244)	0.496*** (0,064)	0.595*** (0,140)	0.368*** (0,047)	-0,112 (0,181)	-0,0846 (0,138)	0,227 (0,246)
Other control variables												
Vehicle type	Included		Included		Included		Included		Included		Included	
Manufacturer	Included		Included		Included		Included		Included		Included	
Type of institution	Included		Not		Not		Not		Not		Not	
Constant	3.476*** (1,077)	-3,312 (3,579)	9.252*** (1,559)	-4,645 (5,234)	-0,121 (2,737)	8,059 (15,660)	-6,243* (3,348)	-2,504 (9,979)	-1,163 (2,599)	-20,44** (8,387)	5,917 (5,448)	34,30*** (12,870)
Observations	36.343	36.343	20.690	20.690	5.073	5.073	3.282	3.282	6.120	6.120	1.178	1.178

Note: Results of multinomial regression are reported. The dependent variable is the categorical variable that takes three values: (1) the final price decreased from the initial price; (2) the final price increased from the initial price; and (3) the price remained unchanged. The base outcome is no change in the price. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

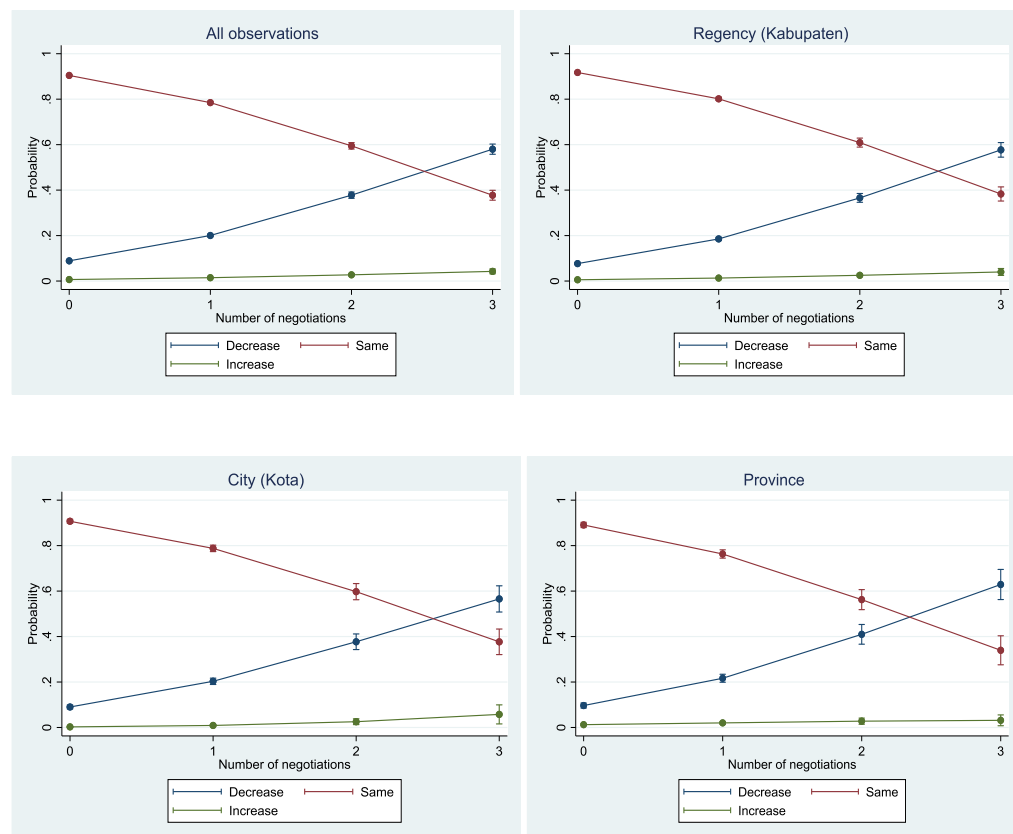
In this multinomial logit regression analysis, the dependent variable’s base outcome is “no price change.” Therefore, the estimated independent variables and the control variable coefficients refer to a relative effect on a price decrease or increase compared to “no price change.” Table 4.2. shows that the key independent variable, negotiation frequency, significantly predicted price changes. Specifically, more frequent negotiations are associated with a higher chance of price decrease and increase. In other words, in a transaction with more negotiations, we are more likely to observe a decrease or an increase in the final price than a situation in which the final price and the initial price are identical. This outcome is similar across all government levels.

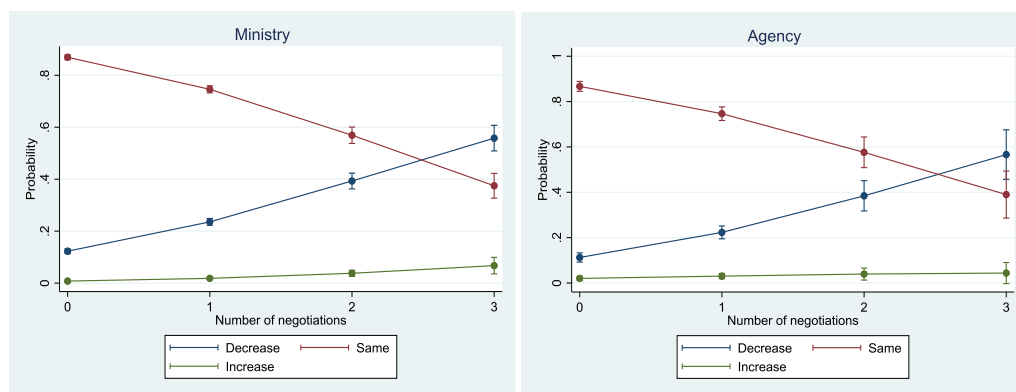
In terms of control variables, quantity, the table presents that quantity is more likely to change the final price and statistically significant in most results. *Agency* is not showing significant effect.

As coefficients from multinomial logistic regressions are not directly interpretable, we report predicted probabilities of observing each outcome using Stata's *margins* command. The outcomes are no price change, price increase, or price decrease as the negotiations' frequency increases. The results are presented in Figure 4.2. Following the regressions, we report the results for all observations and each group of government institutions. The plots indicate that with more frequent negotiation, the probability of price decrease and price increase events increase. For example, for analysis in which all observations are used, the predicted probability of price decrease is approximately 0.09 when there is no negotiation, it increases to 0.20 with one negotiation and to 0.53 with three or more negotiations. Note that with three or more negotiations, the predicted probability of price decline is higher than that of price increase or no price change. This examination displays similar results across government organizations.

We notice a few patterns regarding control variables. The first refers to the product category, with the motorcycle showing a lower probability of price decline than trucks and other products. Second, referring to product manufacturers, Yamaha, Suzuki, Viar, and Hino have a higher probability of price decline than Toyota. Third, Mitsubishi has a lower probability of price decline than Toyota, especially in regency, city, and province levels. This trend could be related to the road quality of regencies, cities, and provinces, in which most Mitsubishi products are suitable for the rough road conditions commonly found in these regions.

Figure 4. 2. Predicted Probability of Observing Each Outcome





Note: Constructed from multinomial logit regressions reported in Table 4.2. The vertical axis shows the predicted probability of observing each outcome. The horizontal axis shows the values of the key independent variable – negotiation frequency.

The estimation result is displayed in Table 4.1. identifies negotiation frequency as an important factor in final purchase. In the majority of the observations, negotiation frequency has a negative relationship with the final sale price, which is observed across regencies, cities, provinces, and agencies. Several calculations were conducted to obtain the effect size of negotiation frequency on the final price; these utilized the *All Observation* coefficient. For example, if the highest initial price of the vehicle were IDR 58,281,000,000, the reduction amount would be IDR 109,568,280. When this is implemented to the highest quantity of items purchased, 1,200 units, the initial unit price is IDR 21,704,000; thus, the reduction amount is IDR 40,804 per unit. Note that the final price is in log form. While our research design did not allow for estimating causal effects, the relationship between more negotiation and reduced-price indicates that government buyers could reduce vehicles' sale price by accommodating negotiation. Thus, our findings support Hypothesis 1.1. In more detail, as illustrated by the predictive probability graphs, more frequent negotiation is related to a greater probability of a reduced final price compared to the initial price. This finding is similar to previous studies that argue that more communication between buyers and suppliers will positively impact the transaction result; positive impacts are a reduced sale price and increased buyer satisfaction (Cai & Jun, 2008; Cannon & Homburg, 2001). The increased probability of reduced price shown in the predictive probability graphs is evidence to support Hypothesis 1.2. This situation has also been noted by Croom & Brandon-Jones (2007). They find price-reduction to be a key impact of e-procurement, obtained from increased leverage in negotiations.

Concurrently, we can see from Table 3.1. that as much as 71.23% of the transactions have no additional negotiation, resulting in situations in which the price did not decline from the initial price suggested by sellers. Even though the e-purchasing system facilitates negotiation, most users on the buyer's side do not utilize it. This event might be because there is no obligation or specific regulation for government purchasers to negotiate in Indonesia and no reward for reducing the initial price. It is argued that negotiators operate by adjusting their environment, especially their organizational environment. Conversely, organizations aim to control employee behavior. Commercial offers may be one of the tools used to control, for example, a purchasing specialists' remuneration scheme and career paths closely related to their performance (Borbély & Caputo, 2017).

Considering the impact of negotiation frequency on final price reduction by buyer organizations, it is observed from Table 4.1. that *Agency* is the organization with the greatest impact on negotiation frequency (coefficient -0.00483); the *City* has the lowest impact (coefficient of -0.000687). As *Agency* is part of the central government and the *City* is part of the local government, this may be evidence to support Prud'homme (1995) claim that central government officials have greater capability than local governments. However, the coefficient

is positive for the *Ministry*, although it is not statistically distinguishable from zero. Therefore, the results are mixed. We do not have enough evidence to support Hypothesis 2.1 which predicted that the negative impact of negotiation frequency on the final price would be greater in magnitude among central government transactions than at the local government level. Similarly, given the finding in Table 4.2 and Figure 4.2, Hypothesis 2.2 is not supported.

5. CONCLUSION AND RECOMMENDATION

The current study's finding highlights a negative relationship between negotiation frequency and the final sale price of vehicles between sellers and government buyers. Meaning that the higher frequency of negotiation lowering the final price. In addition, by having more negotiation, the chances of having price decline are increasing. These findings support Hypothesis 1.1. and Hypothesis 1.2. This study also reveals that the relationship between negotiation frequency and sale price is affected by buyer organization. *Agency*, a part of the central government, displays the highest impact, meanwhile, *city*, part of local government, shows otherwise. However, for *Ministry*, the negotiation frequency does not affect the final price; for the analyses in which the dependent variable is the categorical variable, more negotiations are associated with a higher chance of price decline. However, the magnitude of the change in the predicted probability of price decline is similar to other organizations. Therefore, Hypotheses 2.1 and 2.2 are not supported.

These findings present some important policy implications. In Indonesian public procurement regulation², negotiation is not a compulsory procedure for the procurement process, rather this regulation emphasizes the obligation of using an e-Purchasing system. In a public purchaser's training curriculum, being able to negotiate is a training target. Nevertheless, there is no incentive for government purchasers to do the negotiation and reduce the final price. As per the Ministry of Finance Regulation Number 33/PMK.02/2016, government officials assigned as procurement purchasers receive a monthly allowance with the same amount during their tenure, regardless of their negotiation skills. This regulation could explain why Indonesian government buyers do not utilize the negotiation feature provided by the system. If there is no assurance from the organization related to reducing the amount of transactions to their incentives, there is no point they have to work extra to reduce the price. Furthermore, as noted by McCue, Prier, & Swanson (2015), government monopoly power does not promote efficiency as there is no competition to reduce the price or increase the quality.

Considering the low rate of using this negotiation feature and the potential for reduced government spending, the National Public Procurement Agency (NPPA), as the developer of the e-purchasing system, could collaborate with the Ministry of Finance (MoF) to resolve this issue. NPPA needs to establish an e-purchasing regulation that obliges buyers to negotiate and adjust the system to make negotiation a mandatory process. In addition, MoF may find it necessary to revise the monthly allowance the purchasing officers receive, from a fixed amount to an amount dependent on their negotiation performance. Negotiation-related key performance indicators may be applied to measure a purchaser's performance. In addition, NPPA, as the governmental body that trains public purchasers, should install concern for the importance of negotiation into purchasers-in-training. This step would not only be an advantage for individual performance but also the institution. As argued by Borbély and Caputo (2017), organizations with good negotiation practices not only prove to be more successful but also more innovative.

There are some limitations to the current research. Firstly, although the focus on vehicle commodity garnered useful results, future research could explore other products listed in the e-catalog website. Secondly, as it was not available for study, the messages' content could not be examined. Future research using data that includes the contents of the negotiation

² Presidential Regulation Number 4 Year 2015

messages could then investigate the length of conversation as an alternative independent variable. Finally, upcoming research could investigate other independent variables that influence the probability of change in the final sale price.

6. REFERENCES

- Ahadzi, M., & Bowles, G. (2004). Public-private partnerships and contract negotiations: An empirical study. *Construction Management and Economics*, 22(9), 967–978.
- Auriol, E. (2006). Corruption in procurement and public purchase. *International Journal of Industrial Organization*, 24(5), 867–885.
- Boehm, F., & Olaya, J. (2006). Corruption in public contracting auctions: the role of transparency in bidding processes. *Annals of Public and Cooperative Economics*, 77, 431–452.
- Borbély, A., & Caputo, A. (2017). Approaching negotiation at the organizational level. *Negotiation and Conflict Management Research*, 10, 306–323.
- Borooah, V. K. (2002). *Logit and probit: ordered and multinomial models*. Sage.
- Cai, S., & Jun, M. (2008). A qualitative study of the relationship between interorganizational internet communication and purchasing performance. *International Journal of Management and Enterprise Development*, 5(6), 683–707.
- Cannon, J. P., & Homburg, C. (2001). Buyer-supplier relationships and customer firm costs. *Journal of Marketing*, 65(1), 29–43.
- Chang, H. H., Tsai, Y. C., & Hsu, C. H. (2013). E-procurement and supply chain performance. *Supply Chain Management*, 18(1), 34–51.
- Costa, A. A., Arantes, A., & Valadares Tavares, L. (2013). Evidence of the impacts of public e-procurement: The Portuguese experience. *Journal of Purchasing and Supply Management*, 19(4), 238–246.
- Croom, S., & Brandon-Jones, A. (2007). Impact of e-procurement: Experiences from implementation in the UK public sector. *Journal of Purchasing and Supply Management*, 13(4), 294–303.
- Croom, S. R. (2000). The impact of web-based procurement on the management of operating resources supply. *Journal of Supply Chain Management*, 36(4), 4–13.
- Gujarati, D. N., & Econometrics, B. (2004). As in the previous three editions, the primary objective of the fourth edition of. In *New York*.
- Harney, D., F. (1992). *Service contracting: A local government guide*. Washington, D.C.: Washington, D.C.: International City/County Management Association.
- Harris, R. S., & Abramson, M. A. (2003). State government e-procurement in the information age: issues, practices, and trends. In *The Procurement Revolution*. (pp. vii, 472). Lanham [Md.]: Rowman & Littlefield.
- Heinrich, T. (2012). Communication and reputation in procurement auctions - Some empirical evidence. *Economics Letters*, 114(2), 164–167.
- Jindal, P., & Newberry, P. (2018). To bargain or not to bargain: The role of fixed costs in price negotiations. *Journal of Marketing Research*, 55(6), 832–851.
- Klabi, H., Mellouli, S., & Rekik, M. (2013). A reputation based electronic government procurement model. *ACM International Conference Proceeding Series*, 94–102.

- McCue, C. P., Prier, E., & Swanson, D. (2015). Five dilemmas in public procurement. *Journal of Public Procurement*, 15(2), 177–207.
- Mohr, J., & Sohi, R. . (1995). Communication flows in distribution channels - Impact on assesments of communication quality and satisfaction. *Journal of Retailing*, 71(4), 393–416.
- Mohr, Jakki, & Nevin, J. R. (1990). Communication strategies in marketing channels: A theoretical perspective. *Journal of Marketing*, 54(4), 36.
- Muffatto, M., & Payaro, A. (2004). Implementation of e-procurement and e-fulfillment processes: A comparison of cases in the motorcycle industry. *International Journal of Production Economics*, 89(3), 339–351.
- Prud'homme, R. (1995). The dangers of decentralization. *World Bank Research Observer*, 10(2), 201–220.
- Reddick, C. . (2004). The growth of e-procurement in American state governments: a model and empirical evidence. *Journal of Public Procurements*, 4(2), 151–176.
- Singer, M., Konstantinidis, G., Roubik, E., & Beffermann, E. (2009). Does e-procurement save the state money? *Journal of Public Procurement*, 9(1), 58–78.
- Valley, K. L., Moag, J., & Bazerman, M. H. (1998). "A matter of trust": Effects of communication on the efficiency and distribution of outcomes. *Journal of Economic Behavior and Organization*, 34(2), 211–238.
- Weigand, H., De Moor, A., Schoop, M., & Dignum, F. (2003). B2B negotiation support: The need for a communication perspective. *Group Decision and Negotiation*, 12(1), 3–29.
- Wulff, J. N. (2015). Interpreting results from the multinomial logit model: Demonstrated by foreign market entry. *Organizational Research Methods*, 18(2), 300–325.