Ripped Off? Discrimination against Foreign Shoppers: Field Experiments in the Market Place

Jungmin Lee
Sogang University & IZA

Sangkon Park
Korea Culture & Tourism Institute

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Abstract

We conduct a field experiment in which shoppers negotiate over price at clothing shops. We employ 58 female foreigners speaking 11 different languages and 7 natives as testers. They are instructed to follow a fixed-offer strategy using their own language over the course of bargaining. To parse the extent of statistical discrimination based on search cost, we randomly assign some shoppers to the treatment group, who send a signal that their search cost is low simply by saying "I will check out other stores." We find that both asking for a price reduction and the signaling can effectively get price down. We do not find evidence on taste-based discrimination against foreigners.

Keywords: Discrimination; Statistical Discrimination; Taste-based Discrimination; Price Discrimination; Field Experiment.

I. Introduction

While it is not uncommon that different consumers purchase the same items at different prices, it is usually difficult – often impossible – to identify the reasons for the phenomenon. There are always two competing explanations; the first explanation is price discrimination. Any profit-maximizing seller would charge more a consumer whose willingness to pay is higher. The seller's motivation is legitimate, and the behavior may be legally permitted in many circumstances. The disparate treatment of consumers is a pricing strategy based on the expectation of willingness to pay, thus it is called as statistical discrimination (Arrow 1972). The second explanation focuses on a particular seller or a particular group of sellers. A seller wants to charge more (or less) a consumer whom he or she does not like (or favors). The extra charge is needed to compensate the disutility of the seller dealing with the disliked customer. The disparate treatment is to accommodate the seller's taste (or distaste), so it is called as taste-based discrimination (Becker 1957). There have been a number of papers attempting to parse the nature of discrimination in a variety of contexts such as law enforcement (Knowles et al. 2001; Anwar et al. 2012), job application (Bertrand and Mullainathan 2004), housing rental (Yinger 1986; Ewens et al. 2014), and car sales (Ayres and Siegelman 1995).

An example of discrimination that we often hear from newspaper reports or more directly from friends is that foreign tourists are "ripped off" at restaurants, taxis, and shops. In fact, it does not take long to find such a case at a travel review website like TripAdvisor, even though most cases should go unreported or undetected; often they do not even know that they are overcharged or mistreated. In case of shopping, foreign shoppers could be differentially treated from domestic shoppers for many reasons. They might be willing to pay on average more or less because of their different income level or purchasing power. Foreign tourists

may be willing to pay more because the search cost or the transportation cost is higher. They might be willing to pay less because taking the purchased item home is more costly. Rational sellers should consider as many of those factors as possible that uniquely characterize foreign shoppers and attempt to infer their willingness to pay. The resulting price differential between foreigners and natives is the consequence of statistical discrimination. On the other hand, sellers might have personal likes and dislikes about foreigners – about their appearance, skin color, or home country. Sellers may like or not like customers from a certain country because of some non-economic reasons, such as historical or political relationship or cultural and religious differences between two countries. The disparate treatment of foreigners can be more deeply associated with xenophobia, Chauvinism or ethnocentrism.

In this paper, we examine whether foreign shoppers are differentially treated and, if so, what the source of the disparate treatment is in Korea where we conduct our study. Foreign tourism industry in Kore is growing rapidly. In 2014, more than 14.2 million foreigners visited Korea whose population is about 51 millions. The figure is by 16.6% greater than that in 2013. According to the statistics from the International Visitor Survey (IVS) conducted by the Ministry of Culture, Sports and Tourism, the average expenditure per capita has been growing from 1,224 USD in 2009 to 1,648 USD in 2013. About 47% of the total expenditure is spent to shopping.

We conducted a field experiment at a mega shopping mall in downtown Seoul, the capital city. The place is famous for clothing shopping among foreign tourists. We employed 58 young female foreigners from eleven different language countries and seven domestic shoppers with comparable demographic characteristics as the baseline group. To the best of our knowledge, no previous study has conducted a field experiment on discrimination against

foreign visitors and comparing them from many different countries.[1] The shoppers we hired as "testers" were strictly instructed to follow a fixed-offer strategy (repeating the predetermined same offer until the end of bargaining, regardless of the seller's offer). We selectively recruited testers to have an average look and controlled their clothes and make up on the days of experiment. Holding buyers' behavior and appearance constant is needed to identify sellers' reservation price depending on nationality and language.

As an attempt to parse the type of the disparate treatment against foreign shoppers, we conducted a signaling experiment (Castillo et al. 2013). We randomly assigned shoppers into two groups; those in the treatment group are instructed to say "I will check out other stores" at the last stage of bargaining, while those in the control group are not. The idea is that a major source of statistical discrimination against foreign shoppers is their high search cost; e.g., they are less familiar with the area and how to bargain and have less time for shopping. Then, a signal of low search cost is expected to reduce the disparate treatment against foreigners. The particular signal ("I will check out other stores") was selected via informal interviews with a few sellers (at a different mall from the experimental field) prior to our experiment.[2] Our experiment allows us to compare bargaining outcomes by the treatment across different languages.

The remainder of the paper proceeds as follows. In Section II, we introduce a simple

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[1] There have been several field experiment studies comparing natives and *immigrants*. Bosch et al. (2010) conducted an email audit study to examine discrimination against immigrants in the rental market in Spain. They focused on one largest ethnic group, Moroccans. Balafoutas et al. (2013) conducted a field experiment on taxi rides to examine whether drivers treat passengers differentially and charge differentially depending upon their presumed information about local area and local system. One of their passenger groups is "foreigners" but they all use English.

[2] Many sellers said that such a signal would be a good bargaining strategy for foreign shoppers to obtain a better deal. We are also motivated by the treatment used in Gneezy et al. (2010). To infer the type of discrimination against the disabled, they used a signaling treatment where testers at the automobile body shop note that they are getting a few price quotes. They found that the signal totally eliminated the repair cost estimate differential against the disabled.

model of price discrimination and, based on the model, discuss the identification problem. Section III explains the design of our field experiment and presents the summary statistics describing the data that we collected. Section VI presents our empirical model and regression results. Section V concludes.

II. An Illustrative Model of Discrimination

In this Section, using a simple model, we want to consider price discrimination against foreign shoppers and illustrate the difficulty of parsing the type of discrimination. Suppose that there are buyer i and seller j. The buyer is either domestic ($i = 0$) or foreign ($i = 1$). We assume that the seller is a profit maximizer with no personal taste about the identity of the buyer. That is, the seller is *unbiased* in the sense that he does not treat buyers differently by their home country. The unbiased seller maximizes the expected profit; $Pr(w_i \geq p_{ji}) \cdot (p_{ji} - c)$ where w_i is the buyer's willingness to pay and p_{ji} is the seller's price offer to the specific buyer. c is the constant marginal cost. Thus, $Pr(w_i \geq p_{ji})$ is the expected probability in which the buyer accepts the seller's price offer.

On the other hand, the *biased* seller maximizes the expected profit, but there is a psychic cost arising from his distaste about the buyer's national identity. Let d_{ji} denote the seller's disutility from selling to a buyer from country i. Assume that the disutility arises only if the seller sells the product to the buyer. There is no disutility if the buyer leaves without purchasing. Then, the biased seller maximizes the following objective function:

$$\Pr(w_i \geq p_{ji}) \cdot (p_{ji} - c - d_{ji})$$

Let $F_i(\cdot)$ denote the cdf of w_i conditional on the information set for buyer i. Then, the first-order condition is the following:

$$p_{ji}^* = c + \frac{1 - F_i(p_{ji}^*)}{f_i(p_{ji}^*)} + d_{ji}$$

The above equation clearly shows that there are two sources of the price differential between two buyers from the same seller; the difference in the distribution of willingness to pay and the difference in the taste for national identity. The first part is statistical discrimination and the second part is taste-based discrimination.

Figure 1 shows an example, where we assume that $d_{j1} > 0$ and $d_{j0} = 0$, i.e., the seller dislikes the foreign buyer and that the foreign buyer's demand is less elastic than the domestic buyer's at the same price.[3] In this example, the model predicts that the seller offers a higher price to the foreign buyer than to the domestic buyer ($p_1 > p_0$). The price difference can be decomposed into two parts; parts due to statistical and taste-based discrimination, respectively. In this graph, the difference due to statistical discrimination is larger, so the price difference exaggerates the extent of taste-based discrimination.

The simple model also shows that for the purpose of ascertaining the extent of taste-based discrimination, the previous studies have attempted to control for differences in willingness to pay between different consumer groups. The studies using regression analysis have tried to control for as many confounding variables as possible.[4] The residual group difference is cautiously interpreted as taste-based discrimination. The studies using field experiment, for example, audit studies, have tried to overcome the identification problem by using identical persons or identical applications. Whether those studies correctly parsed the type of discrimination or not hinges upon the question of whether they were successful at

[3] Without loss of generality, we can interpret $(1 - F(p))$ as the demand function representing the proportion of consumers who are willing to buy at price p. Then, the price elasticity of demand (ϵ) is the following: $\epsilon = -((1 - F(p))/f(p))^{-1} \cdot p$. Note that the inverse of the hazard function of $(1 - F(p))/f(p)$ is decreasing if $-f^2 - f'(1 - F) < 0$.

[4] For this reason, regression-based studies keep all control variables as long as they are significant (Yinger 1998).

inducing “sellers” to perceive or believe the distribution of “willingness to pay” identical between two groups.

Now suppose that the foreign buyer can inform the seller that her willingness to pay is actually lower than what the seller thinks. For example, the buyer can propose to the seller a lower price and insists that it is her reservation price. In this case the seller may (or may not) update his belief about the distribution of willingness to pay and, based on the new distribution, suggests a new price. Figure 2 shows an example where the seller updates his belief (moving the inverse hazard function downwardly) and proposes a lower price. The graph shows that the change from p_1 to p' is totally derived from the corresponding decrease in statistical discrimination.[5] In that sense, the extent of the price change can be said to be a conservative estimate for the extent of statistical discrimination contained in the initial price offer.

III. Experimental Design

We recruited 58 foreigners and 7 natives as our tester shoppers. We recruited only young females, who are aged between 20 and 30, since they are the major group of customers at the shopping mall of our study. For the purpose of our study, we recruited foreign testers from various countries, speaking 11 different languages; Azerbaijan, Chinese, English, French, Greek, Indonesian, Japanese, Malaysian, Russian, Thai and Vietnamese (in alphabetical order). The eleven languages are chosen based on the ranking of the average number of visitors per year by country and the availability of testers.[6] We also employed seven Korean

[5] We assume that the seller’s taste is not affected by the process of bargaining. We will discuss the implication of this assumption later when we present our empirical results.

[6] Our experimental design is a “blind” design (Yinger 1998), meaning that the testers are unaware of the exact purpose of the study. We broadly explained that we were surveying the service quality at shopping malls.

native speakers as a baseline group. All testers were paid a lump-sum fixed wage per day. Most of them are graduate students who are studying in Korea.

The experiments were conducted in October and November, 2014. We conducted the experiments only during weekends because there are typically more shoppers during weekends so it is much less likely that sellers can recognize our testers. Although testers do not visit same shops more than once, they might be noticed by those sellers whom they visited before or sellers might notice that current testers are using the same bargaining strategy used by previous testers.

We selected as our experimental field the Dong-Dae-Moon market, which is located in the downtown of Seoul (capital city), Korea. There are mainly three reasons why we selected the place for our experiment; first, as shown in Table 1, the market is one of top five places where foreign visitors mostly frequently shop. In fact, it is the second most frequently visited place as a single unit, next to Myung-Dong. Duty free shops and department stores are more general categories that include multiple locations. Second, shops in the market are highly homogenous. The market is almost exclusively specialized at clothing. Also shops are very similar in terms of size and interior. The high degree of homogeneity among shops is good for ensuring the randomness of assignment of testers to shops. Lastly, there are price tags for most items in most shops in the market, but prices are negotiable. In the market, in reality, most shoppers negotiate over price.

We provided a training session where we explained how to negotiate for a predetermined price and how to behave during bargaining. We tried to control testers' behavior, appearance, facial expression, and intonation.[7] They were only allowed to wear blue jeans and mono-color shirts. They were allowed to wear non-luxurious brand shoes and

[7] We could not objectively screen the testers based on physical attractiveness. Instead we asked our recruiter to select those who are neither attractive nor too unattractive.

bring a simple shoulder bag (not a luxurious brand). All kinds of accessories, such as ring and necklace, were prohibited. The testers secretly keep a recorder that is used to record bargaining. Using the recordings, we verified their recorded data and monitor whether they followed the protocol.

To identify the seller's reservation price, we hold the buyer's behavior constant by using the fixed-offer strategy (Castillo et al. 2013). That is, the buyer can propose only one identical price offer throughout the process of bargaining. The buyer's price offer is predetermined according to the discount rate that we pre-specified. We exogenously varied the discount rate, either 20 or 30 percent. The tester was allowed to propose a price rounded up or down from the exact price implied by the discount rate. In reality, some testers made a mistake when calculating the price and ended up with a price outside of the range that we expected. But we decided to include those observations because still the buyer's price offer is exogenous.[8]

Our bargaining script consists of three stages as follows; at Stage 1, the tester enters the shop which is determined by the experiment, chooses an item of which the regular price displayed on the price tag is within the pre-specified price range (30K-50K Korean Won), and asks the price of the item, simply "How much would this be?" in the tester's own language. The tester receives a price from the seller (initial price offer). If the initial offer is below the target price according to the pre-specified discount rate (20 or 30%), then the tester buys it and there is no further negotiation. The particular discount rates were carefully chosen from our informal interviews with several sellers at a different shopping site but similar to the place of our study, in order to ensure that they are high enough to trigger bargaining but not

[8] We checked whether deviating from the price range is exogenous by regressing the indicator on the treatment variable, experimental controls and tester demographic variables.

ridiculously high. Figure 3 shows the structure of bargaining by stage and treatment, where the initial price is denoted by P_1 and the target price is denoted by P_{Target}.

At Stage 2, the tester asks whether the target price is possible. The tester says "Would [the target price] be possible?" The tester is not allowed to say anything else than the question. The tester receives another price offer from the seller (second offer) and if the price is below the target price, then the tester buys it and the experiment ends. If not, the tester proceeds to Stage 3.

Stage 3 is the last stage and different by treatment. The tester assigned to the control group continues to ask the same question, "Would [the target price] be possible?" Here again if the price that the seller proposes (last offer) is below the target price, the tester buys it and the experiment ends. On the other hand, the tester assigned to the treatment group says "I will check out other shops" and while exiting the shop, once more asks "Would [the target price] be possible?" After receiving the seller's last offer, if it is below the target price, the tester buys. If not, the tester is instructed to leave the shop.

Table 1 presents the summary statistics of the variables that are related to our experimental design. We present the statistics disaggregated by treatment assignment. First, the average regular price is about 40K KRW in both the control and treatment groups, which is about the middle in the specified price range between 30K and 50K. The discount rate which determines the target price is 29-30%, similar between the control and treatment groups. Experimental dates are a bit different between the control and treatment group, but there is no notable pattern. The average age of our testers is 24. The number of testers is different by language. We recruited more testers from countries which are more important in terms of the ranking of visitors to Korea. For example, we recruited 12 Japanese-speaking testers and 8 Chinese-speaking testers. The two countries are ranked first and second in terms

of the number of visitors per year. We have 7 Russians, 7 Vietnamese, and 5 English speakers. We have 4 testers for Malaysian and Thai, 3 testers for Azerbaijan and French, 2 Greek testers. Lastly, we have only one Indonesian. We tried our best to assign testers within languages in a balanced way between the control and treatment groups.

In Table 2, we formally test for the randomness of treatment assignment on observables. First, in Columns (1) and (2), we regressed the treatment indicator on regular price and the asked discount rate, two crucial experimental design variables. Since the variables are determined before the treatment is applied at Stage 3, they should not be affected by the treatment status. Indeed it turns out that there is no significant difference in those variables depending on the treatment status. In Column (3), we check whether the treatment status affects the initial price offer or the price offer at Stage 2. The price offer at Stage 1 and 2 should not be affected by the treatment status because the treatment occurs at Stage 3. The results confirm this.

IV. Empirical Analysis and Findings

A. Empirical Analysis

We examine how the buyer's negotiation (a fixed offer strategy and the signaling of low search cost) affects the price that the seller offers at each Stage.[9] First, we estimate how the seller's offer changes between Stage 1 and 2. The change can be interpreted as the effect of the buyer's price suggestion. Specifically we estimate the following equation:

$$P_{2,ijk} - P_{1,ijk} = \alpha_k + X_{ijk}\gamma + \epsilon_{ijk} \quad (1)$$

where subscripts represent buyer i from country k and seller j. P_t is the price offer at

[9] Another outcome is whether the seller accepts the asked discount rate.

Stage t, normalized by the regular price. The dependent variable is the change of the price offer between Stage 1 and 2. X_{ijk} is the vector of control variables including experimental control variable (regular price, the asked discount rate, and day fixed effects).[10] α_k is the country-specific fixed effect, measuring each country's average price change (or the change in the discount rate) after purging out observable potential confounders. The fixed effect will capture the change in price offer due to the seller's update of his belief on the buyer's willingness to pay, as illustrated in Figure 2. In other words, assuming that the taste about the buyer's home country is constant, the estimated price change will partially identify the extent of statistical discrimination reflected in the initial price.

Similarly, we examine how the seller's price offer changes from Stage 2 to Stage 3 and how the change differs by the language of the buyer. Specifically, we estimate the same equation as Equation (1) by replace the dependent variable with $P_{3,ijk} - P_{2,ijk}$. At Stage 3, there are both the control and treatment groups. To identify the effect of the fixed offer strategy, we restrict the sample to the control group at Stage 3.

Lastly, we estimate the effect of the treatment; signaling a low search cost. We estimate the difference in the mean price offer at Stage 3 between control and treatment groups after controlling for observable potential confounders. Specifically we estimate the following equation:

$$P_{3,ijk} = \alpha_k + \beta_k T_{ijk} + X_{ijk}\gamma + \epsilon_{ijk} \tag{2}$$

where T_{ijk} is the indicator of whether the buyer is assigned to the treatment group when she visits the seller (the treatment assignment can vary by the identity of the seller). In Equation (2), β_k will capture the difference in the price offer at Stage 3 due to the treatment. The estimated price difference due to the treatment also partially identifies the extent of statistical

[10] Figure 4 shows that there is a positive relationship between the asked discount rate and the seller's offered discount rate at Stage 2. This graph means that the price is negotiable depending on buyers' bargaining strategies.

discrimination.

B. Empirical Findings

Table 3 presents average price offers over stages by treatment and by language. The first row shows the path of price offers for those who speak Korean. At Stage 1, Korean-speaking shoppers on average receive 0.91 (that is, 91% of the regular price or 9% discount). The price offer drops to 0.83 at Stage 2. There is no significant change between Stage 2 and 3. Also comparing Columns (4) and (5), we find little difference in the average price offer by the treatment. According to our model, the results imply that sellers update their belief about willingness to pay for Koreans after Stage 1, i.e., once they are told about the target price. But, the insignificance of the treatment status implies that sellers do not statistically discriminate Korean buyers based on their search cost.

A surprising result in Table 3 is that foreign-language buyers actually receive a *lower* price offer at Stage 1 than domestic buyers. This is not expected given that it is typically believed that foreign shoppers are ripped off. Further, looking at the average price offer at Stage 2, we find little differences between Korean and foreign-language shoppers. Column (4) presents the average price offer at Stage 3, the last stage in our experiment, among shoppers in the control group. Again there is not much difference between Korean and foreign shoppers. Chinese, Greek, Japanese and Malaysian shoppers receive a higher price offer than Korean shoppers. But we should note that the average offer is calculated for those who did not get the target price.

The results in Columns (4) and (5) are directly comparable because the treatment assignment is random. While the treatment effect is insignificant and actually the sign is opposite to our expectation for Koreans, we find that the effect is substantial for some foreign

languages. In particular, it is notable that the signal of low search cost decreases the price offer significantly for English-speaking shoppers (from 0.83 to 0.73). The effect is also sizeable for Greek, French and Russian. On the contrary, for Thai and Vietnamese, the sign of the effect is opposite to the hypothesis of statistical discrimination based on search cost.

Table 4 presents regression results for Equation (1) in Columns (2) and (3) and for Equation (2) in Column (4). As the baseline results, in Column (1), we present the regression results for the price offer at Stage 1. The results confirm what we found in Table 3 that foreign buyers receive a lower price offer at Stage 1. After controlling for the regular price and day fixed effect, it turns out that foreign buyers of all languages are treated favorably at Stage 1 by receiving a lower offer. The results in Columns (2) and (3) show how the price offers change from Stage 1 to 2 and from Stage 2 to 3; in most cases, buyers receive a lower offer as they keep negotiating. Not surprisingly, the marginal effect is much greater at Stage 2 than at Stage 3. Korean buyers lower the price relative to the regular price on average by 10.4 percentage points at Stage 2 and additionally by 4.7 percentage points at Stage 3 (simply by repeating the target price once again). The effect is slightly different by language; the marginal effect at Stage 2 is the greatest for Vietnamese (11.6 percentage points) and the lowest for Greek (7.9 percentage points).

In Column (4), we present regression results for Equation (2) where we estimate the signaling treatment effect. Unlike the results for Stage 1 and 2, we find that there are substantial differences across countries. The signaling effect is significant only for five languages; Azerbaijan, Chinese, English, Greek, and Russian. In particular, it is notable that the effect is sizeable for English. For English-speaking buyers, our treatment decreases the price offer by 7.2 percentage points.

As in our model, assuming that taste for foreigners is constant, price changes

between Stages and the change in price due to the signaling treatment represent statistical discrimination. In the left graph of Figure 5, we present the three parts of statistical discrimination that we identified separately. The right panel shows that the total extent of statistical discrimination is different by language; almost 20% of the price offer reflects statistical discrimination for English. The size of statistical discrimination is above 15% for Greek, French, Russian, and Japanese. It is about 14% for Korean. Below Korean is Chinese, Thai, and Malaysian. Still statistical discrimination against Malaysian is about 13%. That is, there is no clear indication that they are more statistically discriminated than Korean buyers.

In Figure 6, we compare the extent of statistical discrimination that we identified with the median amount of per-capita expenditure on shopping. The median expenditure is calculated from the International Visitor Survey. There are 9 countries that we can match by language between our data and the IVS data. Figure 6 reveals an intriguing relationship between statistical discrimination and expenditure on shopping. Those countries whose visitors spend more in Korea are *less* discriminated statistically (while China is a bit an outlier). One interpretation is that sellers lower their offer over the course of negotiation since they *correctly* predict that those from low-spending countries are not willing to pay high. Figure 7 shows that sellers try to charge more for those from high-spending countries at Stage 1, before buyers suggest their target price. Combined with the relationship in Figure 6, the result suggests that sellers determine their initial price offer and negotiate throughout the course of bargaining rationally according to the expectation of willingness to pay.

Recall that foreign shoppers have on average a lower price offer at Stage 1 than Korean shoppers. This does not exclude the possibility that sellers discriminate against foreign shoppers based on their distaste. But a lower price offer at Stage 1 means that, if any, the extent of taste-based discrimination is not large enough to that of statistical discrimination.

In fact, it is also equally possible that sellers actually favor foreign shoppers and give them more discounting.

VI. Conclusion

To identify discrimination against foreign tourists, we conducted a field experiment in which shoppers negotiate over price at clothing shops. We employed 58 female foreigners speaking 11 different languages and 7 natives as testers. They were instructed to follow a fixed-offer strategy using their own language over the course of bargaining. To parse the extent of statistical discrimination based on search cost, we randomly assigned some shoppers to the treatment group, who send a signal that their search cost is low simply by saying “I will check out other stores.” We found that both asking for a price reduction and the signaling can effectively get price down. We did not find evidence on taste-based discrimination against foreigners.

Our findings are somewhat inconsistent with casual observation that foreign shoppers are ripped off. One possible explanation is that, in reality, domestic and foreign shoppers use different bargaining strategies. In our experimental design, we strictly controlled their bargaining strategy (including price negotiation, behavior, appearance, and so on). For example, foreign shopper in reality might not engage in price negotiation as much as we designed in our study. This may be a sort of information problem, i.e., foreign shopper do not know whether they can negotiate or how to negotiate.

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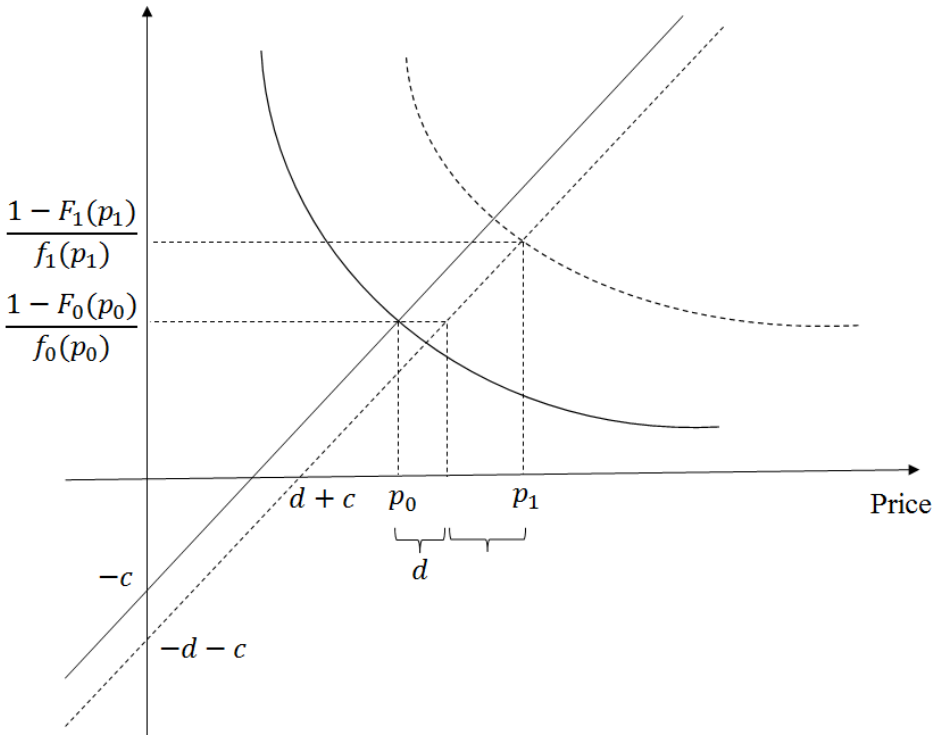
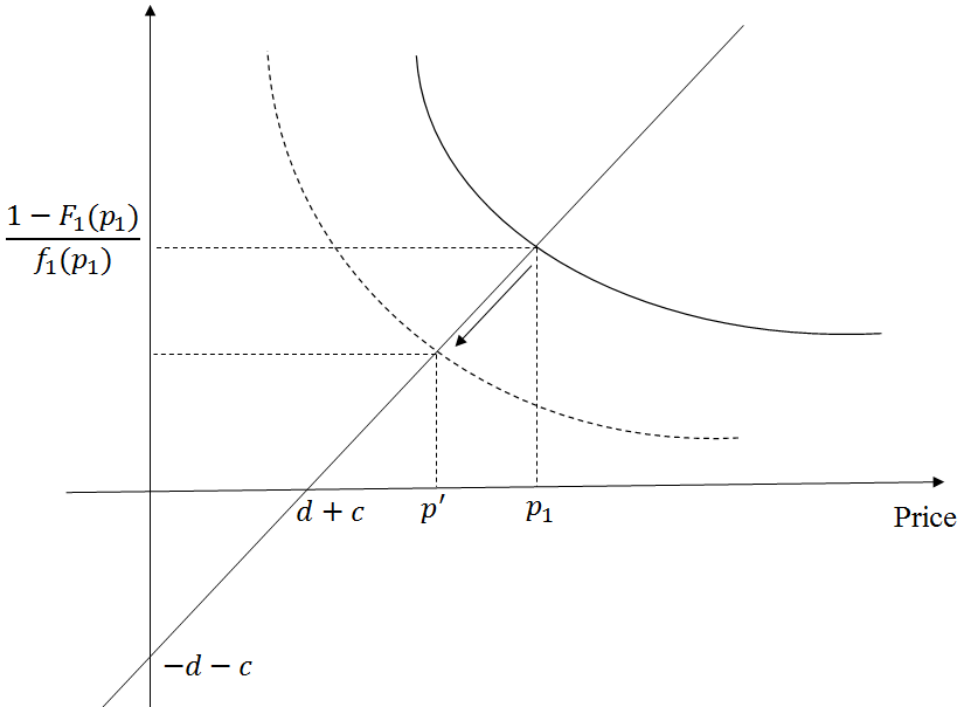
Figure 1. Statistical and Taste-Based Discrimination



Notes: The solid line and curve represent the price offer to the foreign buyer ($d > 0$), and the dashed ones represent the price offer to the domestic buyer ($d = 0$).

Figure 2. Change in Price via Bargaining



Notes: The solid line and curve represent the initial price offer, and the dashed ones represent the second price offer to the same buyer.

Figure 3. Structure of Bargaining

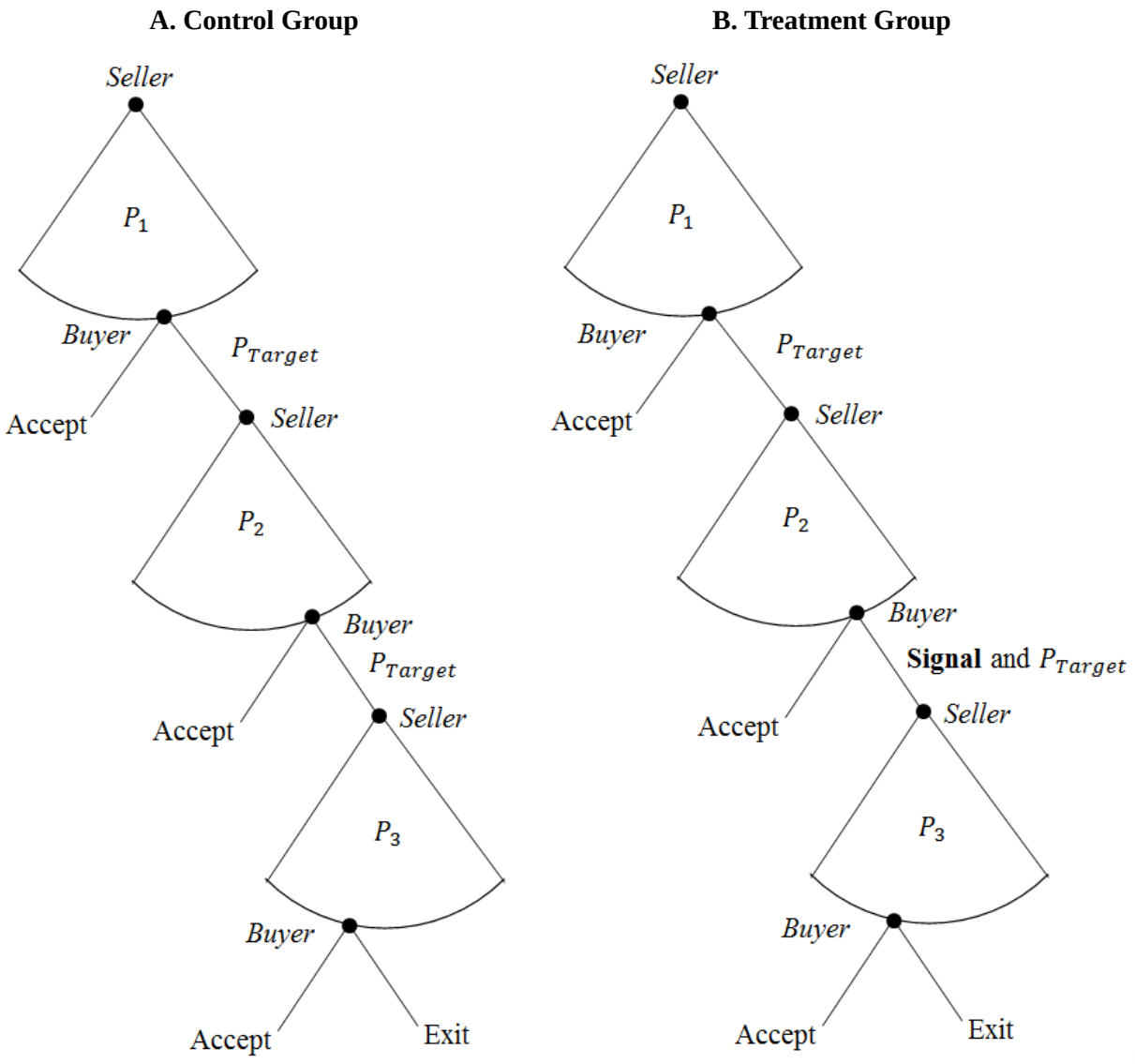
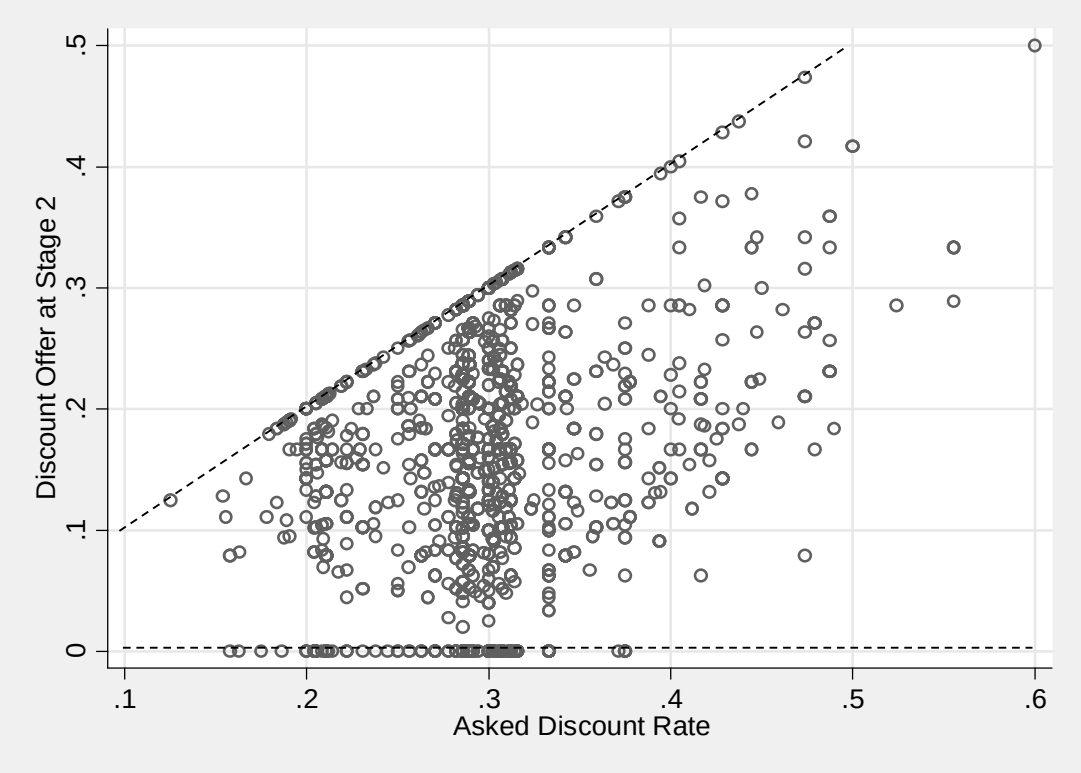
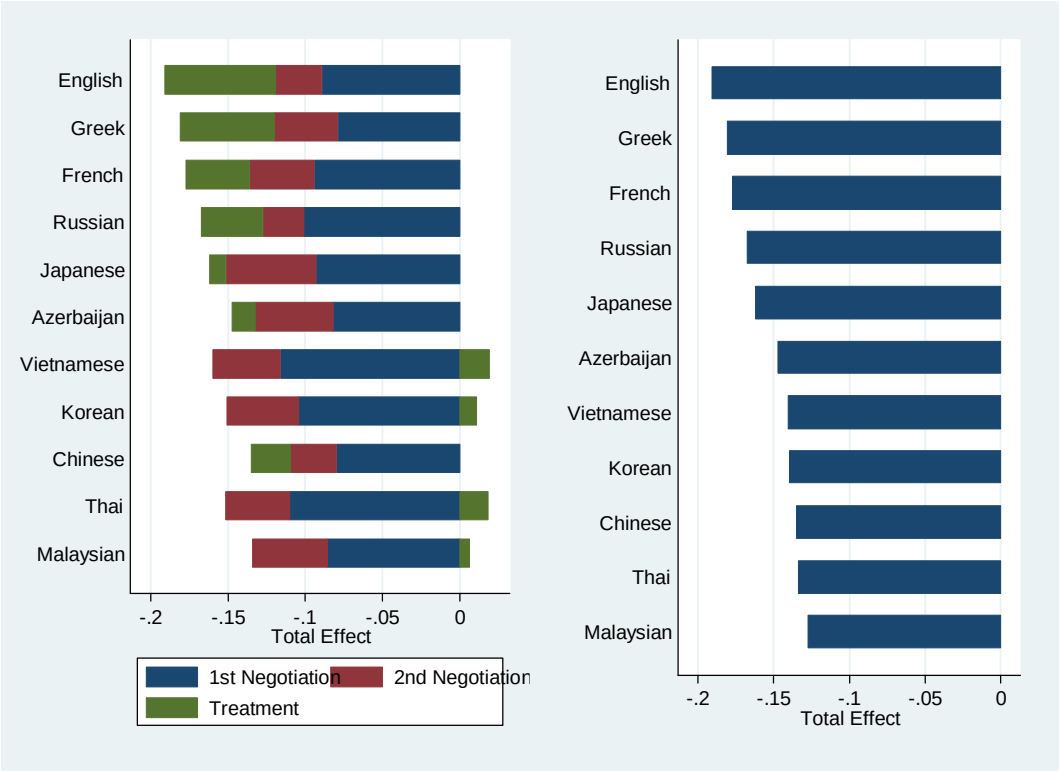


Figure 4. Asked Discount Rate and Discount Offer at Stage 2



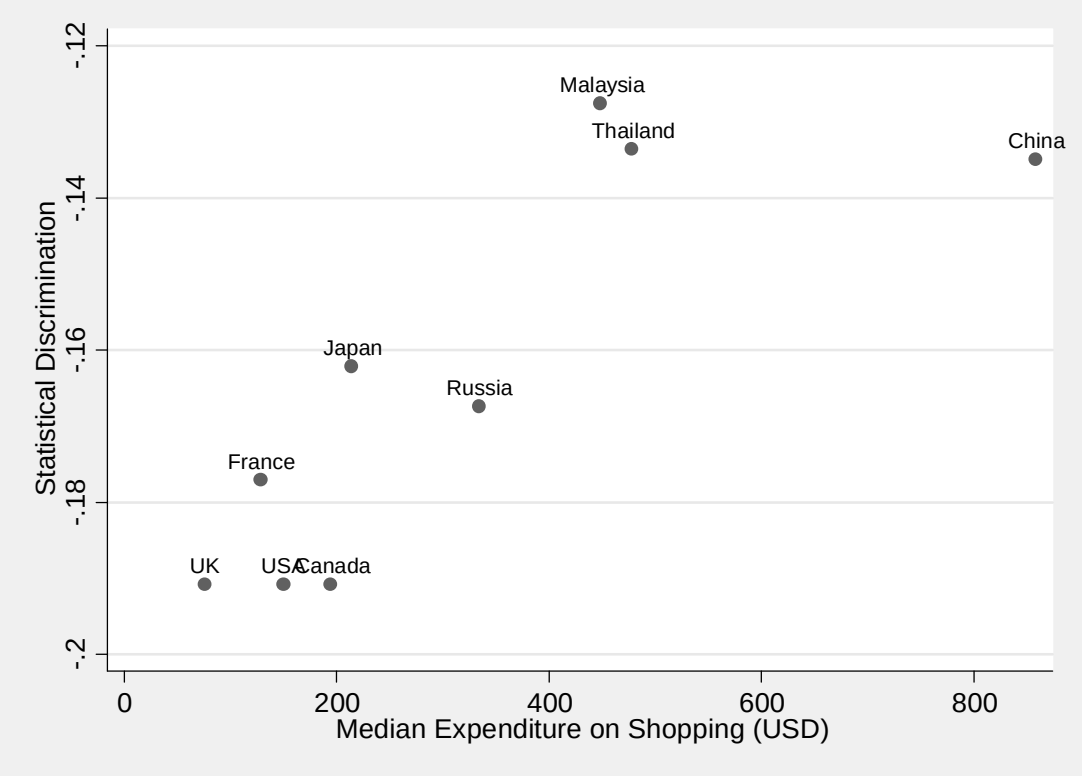
Notes: We have 2187 discount offers from sellers at Stage 2. In this graph, we exclude 77 offers (3.5%) which are either higher than the asked rate or lower than zero. Each circle represents one offer.

Figure 5. Effects of Bargaining by Stage and Treatment



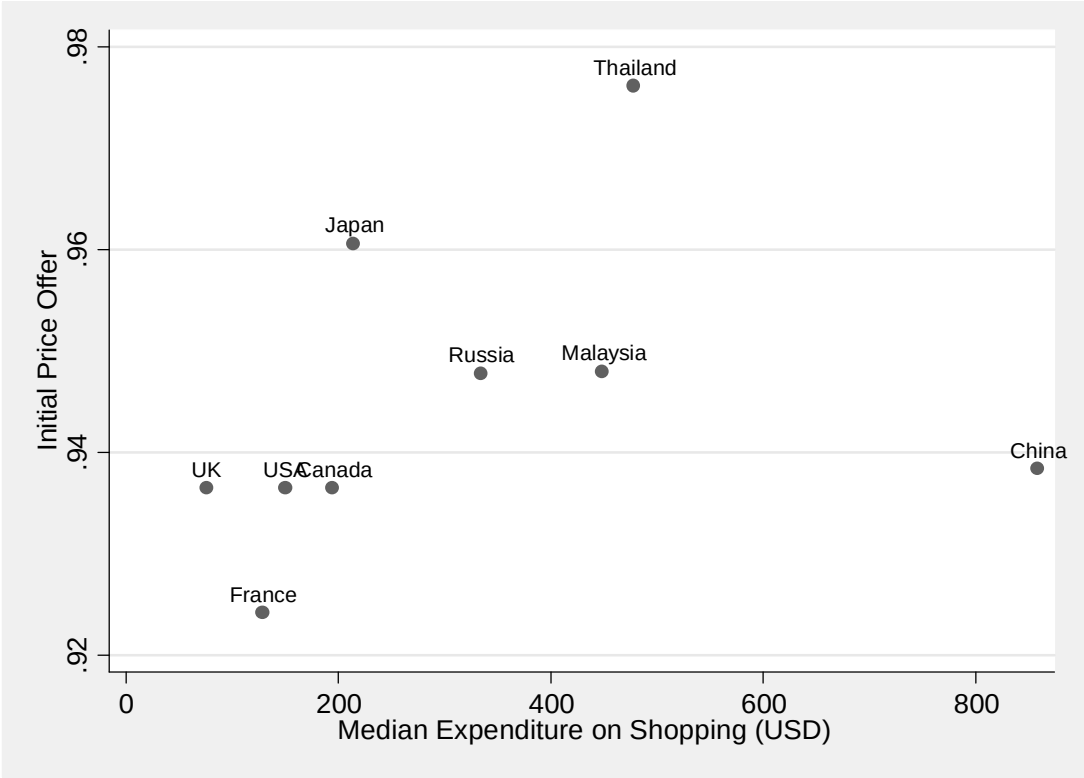
Notes: 1st Negotiation = price change between Stage 1 and Stage 2. 2nd Negotiation = price change between Stage 2 and Stage 3 control. Treatment = price difference between Stage 3 control and treatment. Total effect is the sum of the three.

Figure 6. Statistical Discrimination and Median Expenditure on Shopping



Notes: Median expenditure on shopping is calculated from the International Visitor Survey (IVS). Statistical discrimination is the same as the right graph of Figure 5.

Figure 7. Initial Price and Median Expenditure on Shopping



Notes: Median expenditure on shopping is calculated from the International Visitor Survey (IVS).

Table 1. Foreign Visitors' Most-Frequently Visited Shopping Places in Korea

	2013	2012	2011	2010	2009
Dong-Dae-Moon market	24.9	28.3	25.6	27.2	23.4
Myung-Dong	41.4	41.8	36.4	35.1	31.5
City duty free shops	32.9	27.0	19.6	21.8	20.4
Department stores	26.2	26.4	25.2	29.3	26.9
Airport duty free shops	23.9	19.3	30.0	31.0	44.8
Small retail shops	18.5	19.0	29.2	27.1	24.9
Large discount stores	12.5	15.1	14.7	19.6	20.2
Nam-Dae-Moon market	9.4	11.0	12.1	14.5	16.7
In-Sa-Dong	6.3	6.5	7.6	8.0	7.5
I-Tae-Won	3.7	4.7	5.1	5.6	5.9

Notes: The data source is the International Visitor Survey. Multiple responses are possible.

Table 2. Experimental Design

	Control		Treatment	
	Mean	SD	Mean	SD
Regular price	40.153	5.644	40.258	5.816
Asked discount rate	0.286	0.056	0.299	0.049
Instructed discount rate = 30%	0.854	0.353	0.968	0.177
Oct. 4th weekend	0.273	0.446	0.169	0.375
Nov. 1st weekend	0.189	0.392	0.238	0.426
Nov. 2nd weekend	0.255	0.436	0.303	0.460
Nov. 3rd weekend	0.283	0.451	0.291	0.454
Age	23.685	2.008	23.503	2.143
Greek	0.035	0.183	0.031	0.174
Russian	0.139	0.346	0.089	0.284
Malaysian	0.015	0.122	0.057	0.233
Vietnamese	0.150	0.357	0.197	0.398
Azerbaijan	0.056	0.230	0.051	0.220
English	0.058	0.234	0.028	0.165
Indonesian	--	--	0.030	0.169
Japanese	0.144	0.352	0.219	0.414
Chinese	0.111	0.314	0.106	0.308
Thai	0.073	0.260	0.023	0.150
French	0.068	0.253	0.033	0.178
Korean	0.151	0.358	0.138	0.345
Number of observations	1,067		1,200	
Number of testers	49		49	

Notes: SD is standard deviation. No Indonesian tester is employed in the control group.

Table 3. Random Assignment Checks

Dependent variable	(1) Regular price	(2) Asked discount rate	(3) Offer 1	(4) Offer 2
Treatment	0.0017	0.0031	-0.0056	-0.0077
	(0.0069)	(0.0049)	(0.0096)	(0.0105)
Constant	40.1528***	0.9037***	0.8352***	0.0467***
	(0.1795)	(0.0053)	(0.0047)	(0.0122)
Observations	2,267	2,267	2,187	2,267
R-squared	0.0001	0.0017	0.0026	0.2030

Notes: Robust standard errors, clustered by individual tester, are presented in parentheses. A linear equation is estimated by OLS. In Column (2), we controlled for instructed discount rate.

Table 4. Changes in Price Offer by Stage and Treatment

	(1)	(2)	(3)	(4)	(5)
	Offer 1	Offer 2	Offer 3	Offer 3: Control	Offer 3: Treatment
Korean	0.9134	0.8323	0.8327	0.8280	0.8373
	(0.0931)	(0.0909)	(0.0966)	(0.0970)	(0.0964)
	329	321	259	129	130
Azerbaijan	0.8813	0.8269	0.8163	0.8237	0.8087
	(0.0705)	(0.0702)	(0.0815)	(0.0769)	(0.0860)
	122	118	107	54	53
Chinese	0.8881	0.8336	0.8267	0.8356	0.8181
	(0.0779)	(0.0916)	(0.1004)	(0.1017)	(0.0988)
	247	241	212	104	108
English	0.8993	0.8337	0.7940	0.8264	0.7347
	(0.0792)	(0.0788)	(0.0984)	(0.0899)	(0.0858)
	96	94	82	53	29
French	0.8779	0.8135	0.7896	0.8029	0.7635
	(0.0866)	(0.0766)	(0.0805)	(0.0740)	(0.0873)
	113	107	86	57	29
Greek	0.8507	0.8229	0.8293	0.8615	0.7971
	(0.1176)	(0.0808)	(0.0790)	(0.0794)	(0.0652)
	75	66	58	29	29
Indonesian	0.9098	0.8323	0.8516	--	0.8516
	(0.0940)	(0.1070)	(0.1050)		(0.1050)
	36	36	30		30
Japanese	0.8954	0.8280	0.8209	0.8339	0.8126
	(0.0846)	(0.0968)	(0.0993)	(0.0996)	(0.0984)
	401	396	339	132	207
Malaysian	0.9031	0.8392	0.8398	0.8615	0.8356
	(0.0833)	(0.0937)	(0.1034)	(0.0933)	(0.1055)
	86	85	73	12	61
Russian	0.8942	0.8220	0.8279	0.8469	0.8050
	(0.0870)	(0.0863)	(0.0891)	(0.0854)	(0.0885)
	257	247	207	113	94
Thai	0.9358	0.8516	0.8310	0.8148	0.8938
	(0.0793)	(0.0880)	(0.1088)	(0.1094)	(0.0820)
	106	102	83	66	17
Vietnamese	0.9140	0.8328	0.8302	0.8252	0.8328
	(0.0945)	(0.0874)	(0.0917)	(0.0829)	(0.0960)
	399	374	316	108	208

Notes: Price offer divided by regular price. Standard deviations are in parentheses. Below standard deviation is the number of observations. Column (1) includes all observations. Column (2) includes the cases that did not end at Stage 1. Columns (3)-(5) include the cases that did not end before Stage 3.

Table 5. Regression Results: Changes in Price Offer by Stage and Treatment

Dependent variable	(1) Offer 1	(2) Offer 2 - Offer 1	(3) Offer 3 - Offer 2 (Control)	(4) Offer 3 (Treatment)
Azerbaijan	0.9536***	-0.0818***	-0.0508**	-0.0145***
	(0.0179)	(0.0199)	(0.0210)	(0.0053)
Chinese	0.9384***	-0.0796***	-0.0300	-0.0253**
	(0.0194)	(0.0198)	(0.0183)	(0.0121)
English	0.9365***	-0.0889***	-0.0303	-0.0716***
	(0.0246)	(0.0233)	(0.0211)	(0.0135)
French	0.9242***	-0.0941***	-0.0415**	-0.0415
	(0.0187)	(0.0213)	(0.0191)	(0.0344)
Greek	0.9283***	-0.0787***	-0.0412*	-0.0609***
	(0.0202)	(0.0276)	(0.0207)	(0.0025)
Indonesian	0.9638***	-0.0991***	--	--
	(0.0168)	(0.0203)		
Japanese	0.9606***	-0.0928***	-0.0583**	-0.0110
	(0.0203)	(0.0230)	(0.0235)	(0.0158)
Malaysian	0.9480***	-0.0858***	-0.0481**	0.0064
	(0.0209)	(0.0216)	(0.0199)	(0.0229)
Russian	0.9478***	-0.1009***	-0.0261	-0.0404***
	(0.0161)	(0.0188)	(0.0190)	(0.0111)
Thai	0.9762***	-0.1100***	-0.0417**	0.0181
	(0.0175)	(0.0236)	(0.0186)	(0.0132)
Vietnamese	0.9671***	-0.1160***	-0.0435**	0.0192
	(0.0195)	(0.0224)	(0.0183)	(0.0122)
Korean	0.9823***	-0.1041***	-0.0465**	0.0111
	(0.0198)	(0.0217)	(0.0184)	(0.0099)
Regular price	-0.0009**	-0.0001	-0.0001	-0.0010**
	(0.0003)	(0.0003)	(0.0002)	(0.0004)
Asked discount rate	--	0.0889**	0.0093	-0.4347***
		(0.0408)	(0.0505)	(0.0485)
Day FE	Yes	Yes	Yes	Yes
Observations	2,267	2,187	857	1,852
R-squared	0.9909	0.5090	0.2607	0.9882

Notes: Robust standard errors, clustered by individual tester, are presented in parentheses. Column (1) includes all observations. Column (2) includes those who did not make a deal at Stage 1 and received a price offer at Stage 2. Columns (3) and (4) include those who did not make a deal at either Stage 1 or 2 and thus received a price offer at Stage 3. In Column (4) we include language dummies and their interaction terms with the treatment indicator. Omitting the estimates for the language dummies, we present the estimates for the coefficients for the interaction terms.

Figure A1. Examples of Purchasable Items

Notes: We showed the examples to the testers and instructed that they could buy any items of similar kinds (women's long-sleeve sweaters) between 30K and 50K Korean Won.