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## BARGAINING AT RETAIL STORES: EVIDENCE FROM VIENNA

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## Abstract

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JEL Classification: L81, D12, C78, C93

Keywords: Bargaining, posted price, Trading Mechanism, Audit Study

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# Bargaining at Retail Stores: Evidence from Vienna[*]

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October 22, 2020

### Abstract

In the West, where posted prices are the norm, it is uncommon to observe consumers receive discounts below the posted price. Nevertheless, we find that when stores are asked, a discount is granted approximately 40% of the time, with a median discount percentage of 10%. Discounts are more likely to be offered by small-scale firms, for higher-priced products, and for non-sale items. More generally, differences in price delegation behavior across firm types serve as an indicator that monitoring costs and employee skills are important drivers of bargaining behavior.

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## 1   Introduction

Given the prevalence of posted prices in the Western world, it is easy to forget that they are a relatively recent phenomenon in the history of commerce. In the United States, wholesaler/retailer A.T. Stewart helped to introduce the one-price system in New York in the 19th century. "A set price eliminated the tradition of haggling, an age-old practice that required skill on the part of the seller and surveillance on the part of the owner. The one-price system was key to growth,

allowing merchants to hire inexperienced clerks and cut labor costs."[1] A natural outgrowth of uniform pricing, the price tag, was introduced in the U.S. by department store pioneer John Wanamaker in the mid-19th century.[2] The emergence of posted prices reduced the extent to which firm owners needed to delegate pricing authority, thereby altering the relationship between firm owners and their clerks. Yet anecdotal evidence that some retail stores agree to requests for discounts from consumers would suggest that certain retail firms continue to delegate pricing authority. Until now, no study has empirically studied price delegation at retail stores, and in particular, the extent to which firms allow their salespeople to grant discounts below posted prices.

Our study addresses this question with a novel hand-collected data set that documents the outcomes of interactions between trained auditors and retail store employees throughout Vienna, Austria.[3] In order to analyze the drivers of a firm's propensity to bargain, we hired 12 auditors to visit nearly 300 diverse retail stores in four different commercial areas of Vienna and ask for discounts off posted prices at clothing, shoe, leather goods, jewelry, household goods, and other stores. The auditors were assigned specific stores to visit, find a product in a pre-specified price range, feign credible interest in that product and then ask for a discount. At each store, the auditor engaged in a very brief interaction, typically lasting one minute or less, with one salesperson. Auditors were instructed to refrain from suggesting a specific discount amount or discount percentage.

We find that when a discount was requested by our auditors, it was agreed to approximately 40% of the time overall (303 of 751 products). Conditional on a discount being offered, the median discount size was 15 EUR and the median positive discount percentage was approximately 10%. Furthermore, we found that price delegation is extremely widespread, with just over 60% of the firms surveyed agreeing to grant a discount at least once.[4]

While the frequency and size of discounting that we found is interesting in and of itself, the primary objective of our empirical analysis is to analyze the firm-side factors that influence the likelihood that a discount would be granted. A discount may be offered to a consumer as a

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[1] Howard (2015). The Quakers were also known to have been pioneers of a one-price policy in the U.S. (Kent (1983)).

[2] See https://www.pbs.org/wgbh/theymadeamerica/whomade/wanamaker_hi.html.

[3] According to the OECD, the products sold by the types of retail firms we analyze comprise 20% of total consumer expenditures in Austria. See 2013 data from "Final Consumption Expenditures of Households," available at www.oecd.org.

[4] In the large majority of cases a store was surveyed three times. Also note that 60% is a lower bound on price delegation in that there may have been instances when salespeople were authorized to give discounts but refused to do so.

means to price discriminate when a firm posts a take-it-or-leave-it price offer for all consumers. Price discrimination upon a consumer's request may be profitable on a particular item if a sufficiently motivated, skilled or monitored clerk is approached by a consumer for an item with a sufficiently large (posted) absolute price margin. We therefore expect that a discount would be granted by employees who are given such discretion on items with sufficiently large absolute price-cost margins. Indeed, we find that the probability of a discount increases with the price of the good and is lower for sale items. Later we shall address why posted prices and sales that we observe in our data serve as reasonable indicators of absolute price margins.

Our empirical setting is particularly well-suited for analyzing how firm-side variation predicts bargaining behavior because a relatively small fraction of consumers who visit the stores we analyzed engage in bargaining. We conducted an auxiliary survey of consumers upon their exit from the same stores that were visited during the audit study and found that approximately 6% had asked for a discount prior to leaving the store. This percentage is small enough such that it is unlikely that a firm accounts for consumers who bargain when determining the nature or scale of its organizational structure or when making posted-price decisions.[5] Nonetheless, the percentage of consumers who haggle is substantial enough such that stores must formulate an approach towards this non-trivial fraction of consumers. We exploit this balance for purposes of analyzing firm-side variables as explanatory of bargaining outcomes.

We hypothesize that large-scale firms delegate less pricing authority to their salespeople because firms with a greater span of control are likely to face greater challenges in monitoring their employees. This hypothesis is supported by findings from existing literature, including studies by Qian (1994) and Colombo and Delmastro (1999), which explore the effects of the greater span of control faced by large-scale firms. These studies find that the loss of control faced by large-scale firms increases the difficulty of monitoring employees and also may result in lower employee effort. We consider findings from these studies in conjunction with studies that examine delegation. In particular, Ortega (2009) finds that larger firms grant less discretion and Hansen et al. (2008) show that price delegation increases with intensity of monitoring. Taken together, given the difficulty of monitoring employees at large-scale firms, one would expect such firms to limit the extent of pricing authority delegated to employees. Consistent with this

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[5]For example, it is conceivable that a firm that intends to bargain on prices with a large fraction of consumers would set a deliberately high posted price (as the starting point of any such negotiation). However, in our setting the fraction of consumers who ask for discounts is low enough so that posted prices are chosen predominantly for consumers who do not ask for discounts, and therefore purposeful distortion of prices upwards would not be a sensible strategy.

expectation, we find that discounts were significantly less likely to be granted at large-scale firms (firms with many stores). Note that our hypothesis is not inconsistent with findings that larger firms delegate more responsibility at the plant manager level, which the literature finds can be explained by large firms' advantages in IT/managerial technology, among other factors (Bloom (2009), Bloom et al. (2014)). Our hypothesis relates to discretion at the bottom of the hierarchy and concerns how employees handle information that is hard to quantify (soft information). In particular, technology is not as well-suited to deal with certain types of soft information, such as whether a customer in an offline setting should be granted a discount.

We also find that a discount is more likely to be offered at jewelry stores. This finding is in line with Lo et al. (2016), who show that price delegation tends to increase with salesforce skill and experience. In particular, given that salespeople at jewelry stores tend to require a certain level of training and skill to sell their merchandise, we expect that they are more likely to be granted pricing authority than salespeople in other areas of retail that we analyze. In addition, given that jewelry salespeople are typically well-monitored, this result is also consistent with the findings of Hansen et al. (2008).

We find compelling auxiliary support for the notion that firm scale is an important driver of employee delegation with our finding that large-scale firms are significantly more likely than small-scale firms to offer round percentage discounts (*i.e.*, a discount percentage that is an integer such as 5% rather than 5.2%). Round percentage discounts can serve as an indicator for the extent of delegation because they may signal a constraint to the flexibility granted to employees in making pricing decisions. In further support of this reasoning, jewelry stores are found to be significantly less likely to offer round percentage discounts than other store types.

Since Weinberg (1975), the optimality of price delegation has been a subject of both theoretical and empirical interest.[6] Whereas Stephenson et al. (1979) find that delegation was associated with low profitability, Joseph (2001) showed that limited delegation may be optimal, and Mishra and Prasad (2004) show that an optimally designed contract between the firm and the salesperson may remove the need for delegation. More recent papers that show that some degree of delegation may be profitable include Simester and Zhang (2014), Lim and Ham (2014), and Kräkel and Schöttner (2020).[7] Recent empirical work has also found that some degree of price delegation may be profitable (Frenzen et al. (2010), Homburg et al. (2012), Phillips

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[6]See also Lal (1986).

[7]Delegation emerges in equilibrium under competition in Bhardwaj (2001), however Mishra and Prasad (2005) show that the result does not hold if contractual arrangements are unrestricted.

et al. (2015)). We contribute to this literature by analyzing how price delegation varies across firms using direct (non-survey based) evidence in the form of discounts that are offered below posted prices, interpreting our findings in the context of aforementioned studies that examine the relationship between firm size, employee monitoring, employee skill, and price delegation.[8]

The rest of the paper is organized as follows. We discuss the setting in Section 2 and the empirical analysis in Section 3. Section 4 concludes.

## 2    The Setting

Vienna is a typical large Western European city, consisting of thousands of retail stores, from small independently owned stores to large multinational chains. The vast majority of retail prices are posted and most consumers in Vienna do not ask retailers for discounts.[9] We chose four distinct geographic areas for our study, illustrated in Figure 1: the 1st district, the 2nd and 20th districts, the 18th and 19th districts, and the 6th and 7th districts.

Figure 1: Map of Vienna's 23 districts



Note: Districts where the study was conducted are circled in red. The blue line represents the city's main shopping thoroughfare, Mariahilferstrasse, which forms a natural border between 6th and 7th districts. Tourists are known to frequent Mariahilferstrasse as well as the 1st district.

In order to construct a sample of stores to observe in each geographic area, research assistants (RAs) were instructed to record the name of every retail store on the main thoroughfares of

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[8]In particular, Qian (1994), Colombo and Delmastro (1999), Ortega (2009), Hansen et al. (2008) and Lo et al. (2016).

[9]We conducted an auxiliary survey of consumers upon their exit from the same stores that were visited during the audit study. We found that approximately 6% of consumers ask for a discount at the stores we examined (see Appendix A).

these areas that met certain criteria. Stores that were service-focused (e.g. restaurants, salons, etc.), stores that primarily sell food or beverages, pharmacies, and highly specialized stores (e.g. hearing aids, orthopedic shoes) were not considered. Furthermore, the second highest price of a store was required to be at least 120 EUR; this would rule out stores such as "Tabak" shops, for example. Approximately 750 stores were recorded in total; approximately 300 stores were recorded in the 6th and 7th districts due to its commercial importance in Vienna, and approximately 150 stores were recorded in each of the remaining three areas. Then, from each geographic area, a sample of 40% of the stores (approximately 300 of 750 stores) was selected at random for purposes of observation.

The audit study was conducted between December 9-14, 2013 and between December 27, 2013 and January 4, 2014. Because most stores were visited three times, we split the study into two separate periods in order to allow for a break in between observations. Prior to the beginning of the study, each auditor was individually trained by one of the co-authors. We discuss the selection and training of the auditors in Appendix B and provide a copy of the written instructions given to the auditors in Figure B.1. We empirically examine the behavior of the auditors in Appendix C, noting that the outcomes in our study are partially dependent on their own behavior.

We assigned 12 auditors to ask for a discount on products in a posted price range of 30 EUR to 999.99 EUR at nearly 300 stores. As a result, we were able to collect observations that pertain to a diverse pool of price and firm characteristics and use this information in order to analyze the determinants of a firm's propensity to bargain. Each assignment required an auditor to enter an assigned retail store and pose as a consumer with an interest to purchase a product within an assigned price range. Each auditor approached a salesperson and engaged in a brief interaction in order to feign credible interest in the product and request a discount off of the posted price. The salesperson then either denied the request or approved it with a lower price offer. For each store, there were three distinct price ranges assigned. The ranges were calculated prior to issuing the bargaining assignments using the lowest and second highest prices observed at each store. For each store, auditors were given a store name, address, the nature of the products sold at the store (e.g. clothing), the posted price range within which they should find a product, and the date range on which they should visit the store.

Three separate auditors were randomly assigned to each store in the sample using a stratified approach. More specifically, a random assignment was made with the following restrictions: each

store was assigned a visit by at least one auditor of each gender, each store was assigned to be visited at least once in each period, and the observations of a given auditor were divided roughly evenly across the four geographic areas. No stores were visited twice on the same day and no auditor visited the same store twice.

Auditors were paid 12 EUR per hour. The size of the price range observed, the number of stores visited, the number of visits per store, the areas of the city observed, and the number of auditors employed were dictated by budgetary constraints. Auditors were not paid according to the number of successful bargaining interactions as such a compensation scheme would have incentivized auditors to fabricate their results. Resource limitations prevented us from purchasing products in cases when the salesperson agreed to grant a discount.

## 3 Empirical analysis

### 3.1 Summary statistics

We observe the list price, the sale amount or sale percentage, and the posted price. The posted price is the price that the consumer would pay without explicitly asking for a discount. If the product is on sale, the posted price will be below the list price. Otherwise, the posted price is identical to the list price. In Table 1 we report summary statistics related to price, sales, and discounts. The fourth and fifth rows of Table 1 report summary statistics of discounts granted due to bargaining; these cases are conditional on a discount being granted and are calculated off of the posted price (after any sale).

Table 1: Summary price, sale, and discount statistics

| Variable | Mean | Median | 5th Pctile | 95th Pctile | Obs |
|---|---|---|---|---|---|
| List price (EUR) | 237 | 149 | 44 | 745 | 751 |
| Sale percentage (off of list price) | 31% | 30% | 10% | 57% | 169 |
| Posted price (after any sale) (EUR) | 212 | 135 | 40 | 678 | 751 |
| Discount amount (off of posted price) (EUR) | 25 | 15 | 3 | 80 | 303 |
| Discount percentage (off of posted price) | 10% | 10% | 3% | 25% | 303 |
| Note: Numbers are rounded to the nearest integer. | | | | | |

Figure 2 illustrates the distributions of discount percentages, in which arrows show the higher frequency of 3%, 5%, and 10% discounts.

The principle manner in which we define a firm's scale is according to the number of stores

Figure 2: Distribution of discount percentages
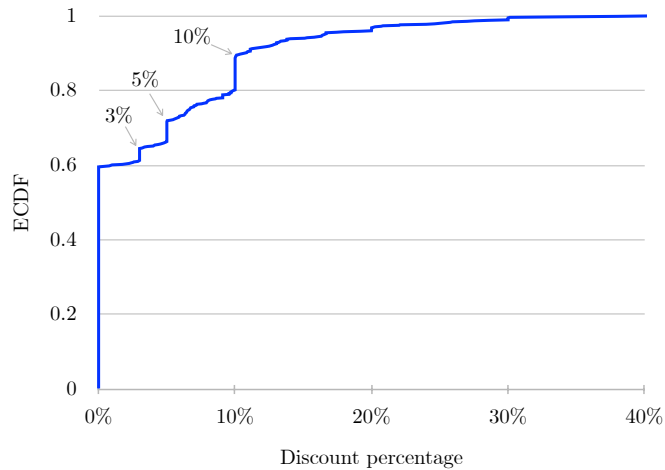


owned by the same firm. We classify a firm owning up to five stores as small-scale and all other firms as large scale. In our data, 186 of the 274 firms own up to five stores.[10] Later we will cite results that are robust to alternative classifications of small-scale vs. large-scale firms, including different store number thresholds and whether the firm is domestic or multinational. We define a store as multinational either if its owner owns the same store outside of Austria or if it is a franchise store whose franchisor is a multinational firm. Figure 3 lists all of the multinational stores in our dataset and the incidence with which a discount was granted at each firm.[11]

## 3.2 Empirical model

We now analyze the drivers of the two primary outcomes of our study - whether or not a firm granted a discount, and if a discount was granted, the size of the discount. We use a flexible model whereby our covariates of interest, which we present and discuss alongside our empirical findings in Section 3.3, are permitted to separately influence the discount offer decision and the size of a discount, the two primary outcomes of our study. We examine these two outcomes using the Truncated Normal Hurdle (TNH) model, the Lognormal Hurdle (LNH) model, and Exponential Type II Tobit (ET2T) model.[12] The discount offer decision is analyzed using a probit regression in each of the three models. Discount size is the dependent variable of a truncated regression in the TNH model, whereas the logarithm of discount size is the dependent

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[10]There are six store pairs, with distinct store names within each pair, that belong to the same chain.

[11]The number of stores owned by the same firm and its multinational status were verified via the Aurelia database offered by Bureau Van Dijk and via firm websites. When firm-scale and multinational status could not be confirmed via either of these two sources, the authors called stores directly.

[12]The LNH and TNH models were first proposed by Cragg (1971). Heckman (1976) originally presented the ET2T for purposes of dealing with sample selection.

Figure 3: Discounting behavior of multinational stores

Never offered a discount | Offered a discount at least once
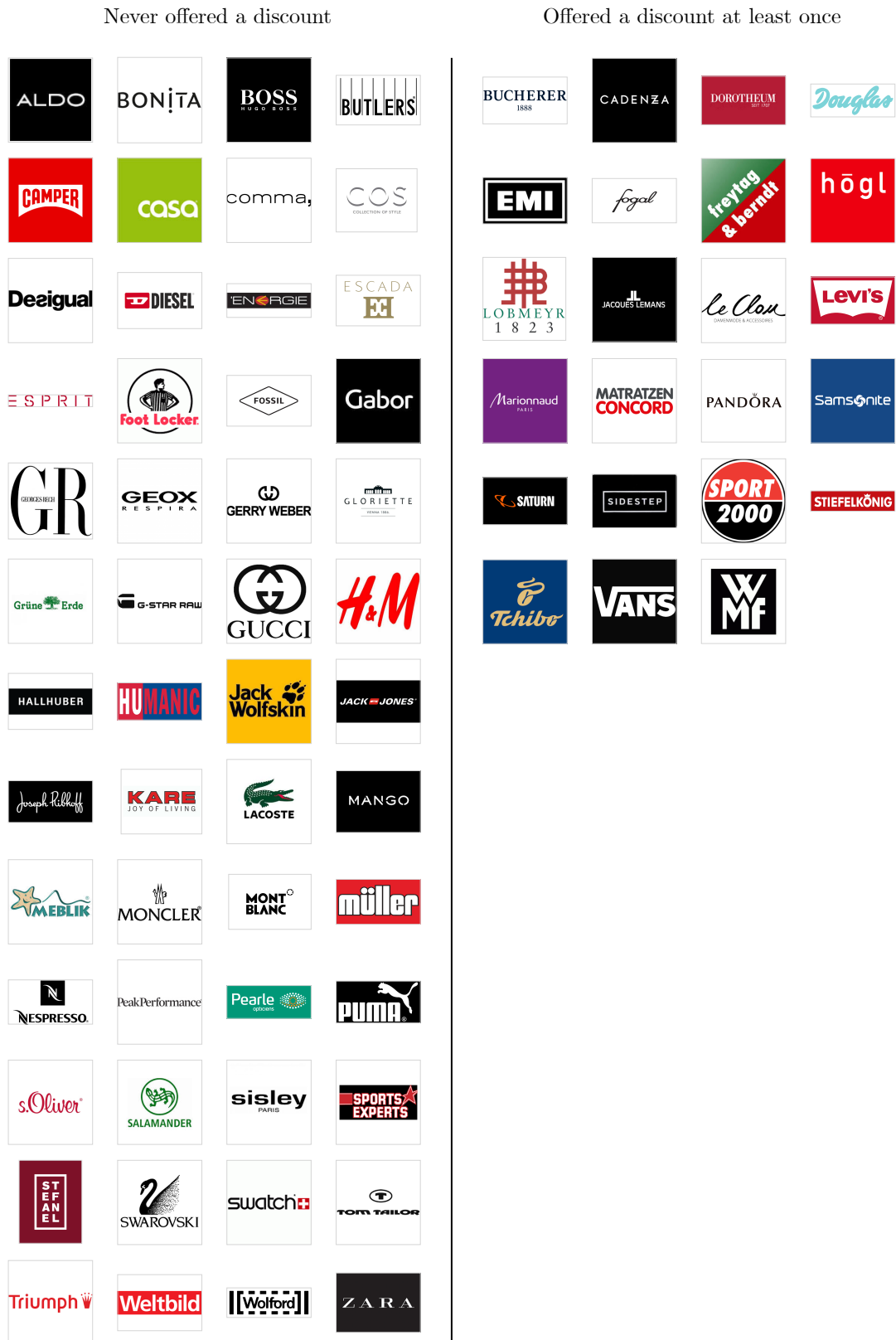


Note: In our study, 75% of stores were observed three times, 18% of stores were observed twice, and 7% of stores were observed once. Appendix C.4 addresses the circumstances surrounding stores that were observed fewer than three times. Aldo, Casa, G-Star, Joseph Ribkoff, Kare, Sisley, Jacques Lemans, Levis, Pandora, and Sport 2000 are franchise stores.

variable of an OLS regression in the LNH and ET2T models.

Our estimates of interest using the ET2T model are qualitatively similar to those in the LNH model.[13] Given the similarity of the LNH and ET2T results and given that we find a statistically significant difference in log likelihoods between the TNH and LNH models, we therefore only report our results associated with the LNH model in what follows.[14]

## 3.3 Discussion of results

The first specification of Table 2 controls for the posted price using price terciles, and the second specification uses the logarithm of the posted price. In the following discussion and in Figures 4-6, we will cite our main results associated with the first specification of Table 2, noting that our results are highly robust to alternative classifications of the covariates. Results pertaining to additional variables that we examine are discussed in Appendix D.

**Price.**   Figure 4a shows that discounts are more likely to be granted for higher priced products. Assuming that bargaining is not costless for the firm, we expect that a discount will be more readily offered on products for which there is a larger difference between price and marginal cost because the per-product profit for such items will be more likely to exceed the cost associated with bargaining. In the large, diverse cross-section of products that we observe, it is reasonable to assume that higher posted prices proxy for higher absolute margins. If this were not the case, then 1,000 EUR items would have smaller absolute margins than 30 EUR items (whose absolute margins may be no greater than 30 EUR), which is very unlikely.

**Sale items.**   We believe that absolute margins are likely to be smaller for sale items because most plausible explanations for sales in our dataset are price reductions due to (i) demand shocks, (ii) price randomization or (iii) inter-temporal price discrimination. Therefore we expect that stores will be less likely to offer discounts for items that are on sale. We find that sale items are significantly less likely to earn a discount than non-sale items by a substantial difference (see Figure 4b).

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[13]A more parsimonious specification of the discount size equation in the ET2T model yields similar results.

[14]We apply Vuong's (1989) test to check whether the difference in log-likelihoods between the TNH model and the LNH model is statistically significant. The test finds that the average difference in the log likelihood between the LNH model and the TNH model is 0.203 and statistically significant at the .01 level. Therefore, we have strong evidence that the TNH model is inappropriate for our empirical application. Also note that the TNH model fits better than a Type I Tobit model using discount amount as the dependent variable, further evidence that a flexible two-part specification is most appropriate in our setting. Applying a $\chi^2$ test with a number of restrictions equal to the number of variables in the Tobit model, the LR statistic is $2(-LL(Tobit) + LL(TNH)) = 2(1667.51 - 1548.53) = 237.96$, which is statistically significant.

## Table 2: Probit and OLS average partial effects

| Variables | Probit | OLS | Probit | OLS |
|---|---|---|---|---|
| | Dep. Variable: Discount offered | Dep. Variable: ln(discount size) | Dep. Variable: Discount offered | Dep. Variable: ln(discount size) |
| Posted price: 2nd tercile | 0.097*** | 0.672*** | | |
| | (0.037) | (0.098) | | |
| Posted price: 3rd tercile | 0.195*** | 1.667*** | | |
| | (0.043) | (0.095) | | |
| ln (posted price) | | | 0.098*** | 0.9*** |
| | | | (0.02) | (0.047) |
| Sale item | -0.255*** | -0.01 | -0.258*** | 0.057 |
| | (0.041) | (0.187) | (0.041) | (0.172) |
| Large-scale | -0.197*** | 0.029 | -0.193*** | -0.031 |
| | (0.051) | (0.135) | (0.05) | (0.134) |
| Shoes / leather goods stores | -0.026 | -0.095 | -0.03 | -0.168 |
| | (0.062) | (0.17) | (0.063) | (0.176) |
| Jewelry stores | 0.181*** | 0.223* | 0.17** | 0.045 |
| | (0.066) | (0.127) | (0.067) | (0.128) |
| Household goods stores | 0.022 | 0.379** | 0.011 | 0.259 |
| | (0.081) | (0.159) | (0.08) | (0.158) |
| Other goods stores | 0.006 | -0.18 | 0.006 | -0.181 |
| | (0.048) | (0.122) | (0.048) | (0.121) |
| More than two employees | -0.126** | 0.011 | -0.128** | -0.039 |
| | (0.052) | (0.135) | (0.052) | (0.123) |
| No customers observed | 0.067 | 0.269** | 0.066 | 0.28*** |
| | (0.046) | (0.108) | (0.046) | (0.102) |
| Female salesperson | -0.058 | -0.169* | -0.055 | -0.129 |
| | (0.041) | (0.09) | (0.04) | (0.087) |
| Dec 27 - Jan 4 | -0.063** | 0.052 | -0.06** | 0.105 |
| | (0.028) | (0.078) | (0.027) | (0.072) |
| Geographic controls | Y | Y | Y | Y |
| Salesperson age controls | Y | Y | Y | Y |
| Auditor fixed effects | Y | Y | Y | Y |
| | | | | |
| Observations | 751 | 303 | 751 | 303 |
| LNH model log likelihood | -1,500.505 | | -1,475.651 | |

Note: Default categories are 1st tercile, non-sale items, firms with up to five stores, clothing stores, up to two employees, no customers observed, male salesperson, and Dec 9 - Dec 14. Interactions for price✕firm scale, sale✕firm scale, and time period✕sale are included in the probit regressions. Standard errors are clustered at the store level. (***) Significant at the 0.01 level (**) Significant at the 0.05 level (*) Significant at the 0.1 level

Figure 4: Average predicted probability of being offered a discount

(a) Price terciles

(b) Sale vs. non-sale items
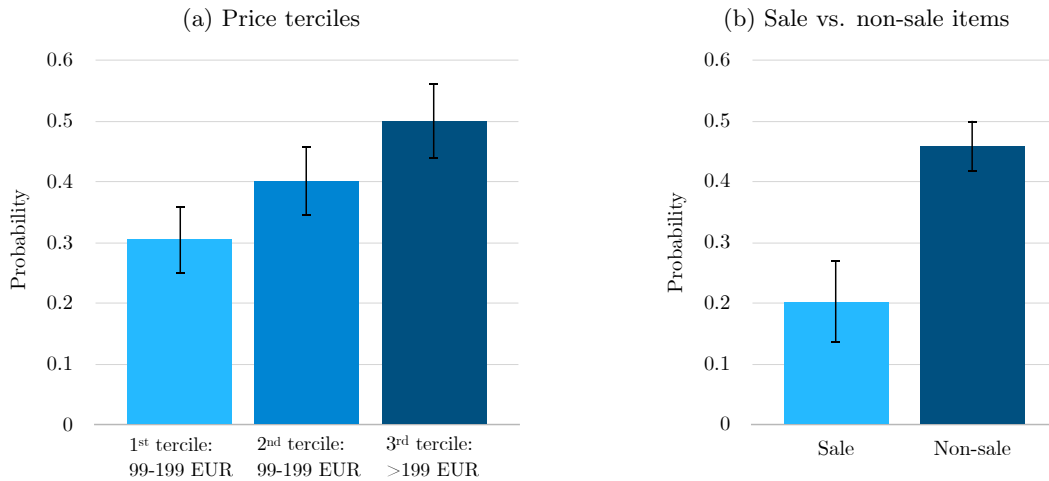


Note: The average predicted probability of observing a discount is statistically significantly different between each of the three pairs of price terciles at the 0.05 level. Brackets denote 95% confidence intervals.

**Firm scale.** Our results indicate that discounts are significantly less likely to be granted at large-scale firms. In particular, whereas our model finds that the average predicted probability of small-scale firms offering discounts is 46%, the average predicted probability of large-scale firms offering discounts is 27% (see Figure 5a). Our results are similar if we define small-scale firms as domestic and large-scale firms as multinational (45% vs. 28%), or whether our small-scale firm threshold is three stores (48% vs. 28%) or ten stores (46% vs. 25%).

Earlier we hypothesized that large-scale firms delegate less pricing authority to its salespeople because firms with a greater span of control are likely to have more difficulty monitoring at the lower levels of the hierarchical pyramid, a hypothesis rooted in findings from existing literature.[15] However, it is worth exploring alternative explanations for this empirical result.[16]

First, one might argue that large-scale firms face more intense competition than small-scale firms, which in turn leads them to delegate less pricing authority. While such an explanation is in line with Mishra and Prasad (2005), their study considers more complex contractual arrangements, which may be less realistic in our retail environment.[17] Moreover, this explanation would stand in contrast to Bhardwaj (2001), who finds that delegation increases with com-

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[15]In particular, Qian (1994), Colombo and Delmastro (1999), Ortega (2009), Hansen et al. (2008) and Lo et al. (2016).

[16]Note that in order to deal with high monitoring costs, a large-scale firm may compensate salespeople with commissions. However, it is not clear whether one would expect commission-based compensation (which we do not observe) to increase or decrease pricing delegation authority. While such compensation may increase salesperson motivation, such a scheme may result in a misalignment of incentives between the salesperson, who seeks to maximize revenues, and the firm, which seeks to maximize profits.

[17]Furthermore, we control for additional variables including store type and city area, which are likely to proxy for differences in competition.

petition. Furthermore, we find no significant effect of firm scale on discount size. If indeed large-scale firms were faced with more competition, then one would expect that the absolute margins associated with their posted prices would be lower, and therefore they would not be able to offer comparable discount sizes to those offered by firms that face less competition.

A second alternative explanation for our finding that large-scale firms are less likely to offer discounts than small-scale firms is that large-scale firms are more proficient at setting prices, and thus do not find it as profitable to offer discounts. However, if this were the case, this explanation could not explain why we observe that large-scale firms offer a significantly larger fraction of round percentage discounts relative to small-scale firms, a finding we address in more detail in Section 3.3.1.

Figure 5: Average predicted probability of a discount
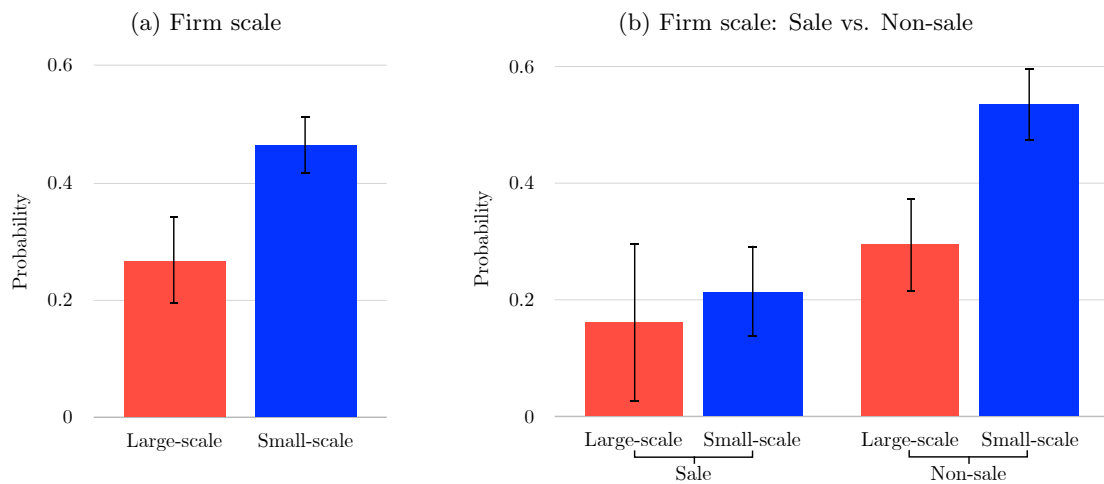


Note: Brackets denote 95% confidence intervals.

**Firm scale and sale items.** Given that the willingness of a large-scale firm to bargain is lower than that of a small-scale firm, we would expect that the reduction in propensity to bargain due to a sale will be smaller at large-scale firms relative to small-scale firms. For this purpose we interact sale status with firm scale, and find that the difference in willingness to bargain between small-scale and large-scale firms is less pronounced for sale items. This is intuitive given that absolute margins for products with the same posted price are likely to be lower for sale items, and therefore we would expect that the difference in bargaining propensity between small-scale and large-scale firms will be less pronounced for sale items (see Figure 5b).[18]

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[18]We reject at the .05 level the hypothesis that the reduction in the predicted probability of a discount across small-scale and large-scale firms is significantly different for sale items vs. non-sale items.

**Store type.** We classify observations collected from five different store types: clothing (96 firms, 270 observations), shoes/leather goods (32 firms, 94 observations), jewelry (35 firms, 96 observations), household (25 firms, 66 observations), and other (86 firms, 225 observations). These designations seek to control for differences in the way stores are run across retail industries.

Given that jewelry salespeople tend to be highly trained and are likely to be well-monitored, it is informative to examine how bargaining outcomes at jewelry stores differ from outcomes at other retail stores.[19] We predict an approximately 56% probability of earning a discount on products sold at jewelry stores. No other store category exceeds a predicted probability of 40% (see Figure 6). This result is consistent with evidence presented by Lo et al. (2016), who find that employee skills are positively correlated with the extent of pricing delegation granted to salespeople. This finding also would appear to be consistent with Hansen et al. (2008), who show that price delegation increases with monitoring intensity.

Also note that store type designations capture crude differences in competition. While posted prices and sales serve as proxies for absolute margins for reasons discussed earlier, store type indicator variables serve as additional controls for products across store types that share the same price but for which marginal cost differs across product markets due to differences in competition intensity. Along these lines, to the extent that absolute margins are higher in the retail jewelry business than the other retail areas that we examine, such a phenomenon would also be captured by the store type variables.[20] Nevertheless, additional evidence that we provide regarding round percentage discounts in Section 3.3.1 reinforces the notion that any such difference in absolute margins across product markets is not the sole driver of the difference in bargaining outcomes that we observe at jewelry stores.

**Number of visible employees.** We control for the number of visible employees at the store, noting that a salesperson encountered by our auditor in stores in which there were only one or two visible employees is more likely to be a manager or an employee who is well-monitored. Therefore, this variable serves as an additional indicator of the discretion possessed by the salespeople that our auditors encounter. Consistent with our expectations, we find that stores with more than two visible employees (approximately 34% of firms surveyed) were significantly

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[19]For example, see https://instoremag.com/training-jewelry-salespeople-guide/.

[20]While we do not have data on margins, Sageworks found that Jewelry, Luggage, and Leather Goods stores had the highest pretax net profit margins of all store categories examined ("Which retailer type is most/least profitable?" *Forbes*, November 11, 2011).

Figure 6: Average predicted probability of being offered a discount
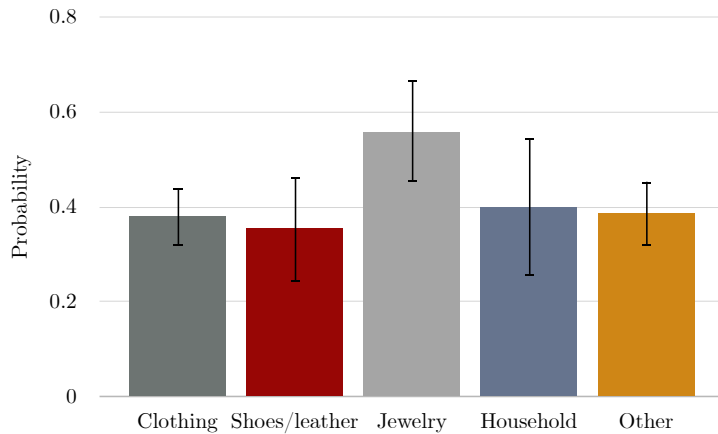
less likely to offer a discount (32% vs. 44%).[21] This finding is also consistent with Hansen et al. (2008), who find that delegation increases with monitoring, as noted earlier.

**Number of customers.** We sought to distinguish between stores that were observed to be empty with stores that were observed with customers, expecting that bargaining outcomes will be more favorable at stores that are generally empty because salespeople at such stores may be less concerned about other customers learning of such interactions. No customers were observed at nearly half of the stores surveyed. While we find no difference in the likelihood of receiving a discount at stores that were observed with no customers, we do find that when discounts are granted, they are significantly larger in size at stores which were observed to be empty.

### 3.3.1 Round percentage discounts

In this section we provide further evidence regarding the *type* of discount granted.[22] In principle, a discount may be offered as a round percentage (e.g., 3%, 5%, 10%) or in a euro amount that is unlikely to have been offered by the salesperson as a percentage. Due to the focal nature of round percentage discounts, one may interpret such discounts as a proxy for constrained authority granted to the salesperson, whereas instances of percentage discounts that are not round integers (e.g., 3.2%, 5.4%, 10.3%) are more likely to signify authority delegated to the

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[21]The employee asked a manager for permission to offer a discount in 6 out of 751 observations, and permission was granted in each case.

[22]Some of the discounts offered were contingent on payment in cash or required store membership. In Appendix E, we report summary statistics related to cash and membership discounts.

salesperson that is less constrained or perhaps unconstrained. Exploiting this information, we run a probit regression using the same right-hand-size variables as the discount size regression on the 303 observations for which a discount was granted, using a round percentage discount indicator as the dependent variable. We find that large-scale firms offer a substantially higher fraction of round-percentage discounts relative to small-scale firms after controlling for other variables, as shown in Figure 7a.[23] We also find that discounts at jewelry stores are less likely to be offered in round percentages than at other retail stores in our data (Figure 7b).[24] In conjunction with our finding that small-scale firms and jewelry stores are more likely to offer discounts, this result serves as compelling auxiliary empirical evidence that an important driver of the differences in bargaining propensity that we observe across stores is the variation in discretion granted to salespeople across different types of firms.

Figure 7: Average predicted probability of being offered a round percentage discount
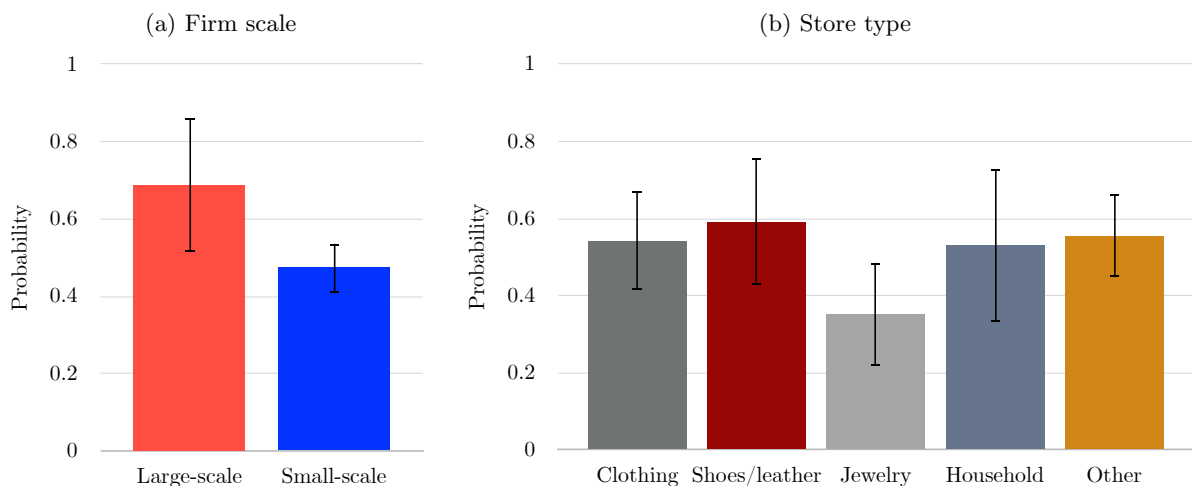


Note: The average predicted probabilities reported above are conditional on being offered a discount (N=303). Brackets denote 95% confidence intervals.

## 4   Conclusion

Our study shows that bargaining at retail stores is widespread and that discounting behavior is substantially influenced by several factors, including the scale and type of firm. From these

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[23]The difference in probabilities is statistically significantly different at the 0.05 level.

[24]One can also predict the fraction of round-percentage discounts across firm types (i.e., small scale vs. large scale and jewelry vs. other store types) by running a multinomial probit regression on all observations, whereby the possible outcomes are no discount, round percentage discount, and non-round percentage discount, controlling for the same variables as in the probit regression described above. The fraction of round percentage discounts across firm types implied by the multinomial probit specification are nearly identical to those reported in Figure 7.

results we may conclude that small retailers, who are often at a competitive disadvantage in terms of cost and technology (including the technology used to set prices), can and do use price delegation as a means of erasing some of the competitive disadvantages they may face. This is bound to change as we enter a period of rapid transformation in which much of retail is moving online, and even prices in offline aisles may be set with the aid of cameras and electronic price tags. More generally, the world of retail may be moving towards technologically-assisted individualized prices more than a century since uniform prices gained popularity. Until then, stores continue to use clerks to personalize prices, and our study represents only one step towards developing a better understanding of this phenomenon.

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