Shopping While Female: Who Pays Higher Prices and Why?

By Anne Fitzpatrick*

Whether men and women pay the same prices for the same good is a central tenet of consumer equity. Similarly, identifying whether observed price differentials are due to taste-based (Becker, 1957) or instead statistical discrimination (Phelps, 1972) is important for correcting disparate outcomes. However, the evidence on gender price differentials is mixed and primarily restricted to the limited context of the US car market. While the audit study of Ayres and Siegelman (1995) finds mean price differentials by race and gender, Goldberg (1996) finds no mean price differentials using survey data. She finds that the variance of prices differs by gender and race, consistent with statistical discrimination. Notably, aside from Castillo et al. (2013) in the Peruvian taxi market, there are few studies examining price differentials in other markets or the developing country context. This gap is noteworthy because in developing countries bargaining is pervasive and regulations are weak. Therefore, prices may vary considerably, and potentially by gender.

In this paper, I present results on gender price differentials from an audit study conducted in the Ugandan antimalarial drug market. This market forms an ideal setting for estimating gender price differentials and testing underlying causes because 1) its global importance and 2) market-specific characteristics. Malaria is the most common illness in sub-Saharan Africa, and untreated malaria may be fatal. Thus, price differentials would have direct implications for health inequality and potentially gender-specific mortality. In order to increase access to effective treatment through the private sector, this market is heavily subsidized. As a result, spending on antimalarial subsidies is one of the biggest expenditures in the global health sector. Furthermore, at the outlet level, prices are not posted, bargaining is common, and there is no health insurance. As a result, prices are directly observable and vary by individual. In contrast to the car market specifically, prices levels allow for analysis of completed rather than hypothetical transactions. Finally, antimalarial drugs are relatively homogeneous, reducing the likelihood of gender-specific

* anne.fitzpatrick@umb.edu. University of Massachusetts, Boston, 100 Morrissey Blvd, Boston, MA 02125. I am grateful for financial support from NSF Dissertation Improvement Grant and the following sources at the University of Michigan: Department of Economics, Department of Afro-American and African Studies, African Studies Center, Rackham Graduate School, Center for Public Policy in Diverse Studies, Center for International Business Education, & Center for the Education of Women). This study received ethical approval from the UM-IRB (HUM00067957) , the MUST-IRB (No. 18/09-12), & the UNCST (IS -93).

preferences that may affect equilibrium prices.

I find that women are offered higher prices for the same product as men. However, women are more successful at bargaining for a discount. Thus, final transaction prices do not differ by gender. From a policy perspective it is relevant to determine whether observed price differentials are most consistent with statistical or taste-based discrimination. Therefore, I contrast the results of gender with the results of being of a minority ethnic group ("tribe") in the study area. Charging minority tribes higher prices would, for example, potentially reflect supplier animus. I find that sellers offer minority tribes lower prices, suggestive of statistical discrimination. This study highlights that studies focusing only on offer prices as opposed to completed transaction prices may overestimate the extent of gender price discrimination.

I. Experimental Design and Data

This study was conducted in 2014 in 45 randomly selected parishes in 5 districts of Uganda.[1] A census of all outlets selling antimalarial drugs was conducted within each parish. In total, 504 outlets were found in 142 village "markets."

At each outlet, two mystery shoppers each purchased an antimalarial drug according to randomly assigned scripts. During the transaction, all shoppers bargained and bought a full adult dosage of an antimalarial drug. Shoppers then filled out a detailed survey on the transaction.[2] Later, all purchases were tested for chemical quality using a handheld spectrometer. The analysis sample uses the 879 purchases that could be tested for quality.

II. Empirical Strategy

I first report unconditional mean prices by gender. Offer prices–the price that vendors ask for prior to bargaining– for the final drug purchased are $3.53 for women and $3.30 for men. The standard deviation is similarly higher for women ($1.91) as compared to men ($1.69). The overall offer price distribution is different according to a Komolgorov-Smirnoff test (p=0.049). However, prices paid are nearly identical; women pay $2.97 and men pay $3.00. These results are driven by the fact that women successfully bargain for a discount in 66 percent of all transactions, while men successfully bargain in 51 percent of all transactions. However, these averages may reflect unobserved shop or market-level characteristics.

Therefore, to identify price discrimination, I compare outcomes between shoppers of

[1] Additional details of sample selection are documented in Fitzpatrick (2016).
[2] For a discussion of results and the full protocol see Fitzpatrick (2016).

different groups within an outlet. There are 16 total shoppers, and half of shoppers are female. Shoppers are of the minority tribe in 52 percent of visits. I estimate the following specification:

$$Y_{is} = \beta_0 + \beta_1 Female_{is} + \beta_2 Minority_{is} + \beta_2 FemaleXMinority_{is} + \gamma_s + \delta' X + \epsilon_{is} \quad (1)$$

where *Female* is a dummy variable indicating whether or not the shopper is female; *Minority* is a dummy variable indicating whether or not the shopper is of a minority tribe in that geographic area. Y is measures of price for transaction i in outlet s. I include an outlet fixed effect, γ, to control for confounding factors that vary at the shop level, such as vendor or market characteristics. I also include a vector of covariates, X, to account for the randomly assigned script and other variables related to potential issues of omitted variables bias. The error term ϵ is clustered at the outlet level.

In Table 1, I present evidence that characteristics of the transaction likely unrelated to outcomes are balanced between male and female shoppers, conditional on an outlet fixed effect and the preferred set of controls. The exception is the language spoken during the transaction. Males are more likely to speak Luganda than English. However, these differences are likely not cause for concern. English and Luganda are both official languages of Uganda, and price and quality measures are uncorrelated with language spoken (not shown). Furthermore, all results are robust to including controls for language. However, I cannot rule out the possibility that language is one mechanism through which males signal information to vendors about their demand characteristics.

III. Results

Results are in Table 2 show that, compared to men, vendors initially offer women a price that is \$0.33 (15 percent) higher as compared to what they charge men. This effect is entirely concentrated on women of the majority tribe. The interaction effect between females and minorities completely offsets the main effect of being female. On the other hand, minorities are offered lower prices, with larger effects on female minorities. As a result, the joint effect of being of a minority tribe is also significantly negative.

However, while women are offered significantly higher prices than men, they are also more likely to successfully bargain. The average unconditional price decrease women obtain is \$0.52 (13 percent). In contrast, minority tribe members are offered lower prices but are also less likely to successfully bargain for a discount. On net, prices paid do not differ significantly between genders, although minority tribe members do appear to pay slightly

lower prices (p-value =0.101). All results are robust to the inclusion of a drug type fixed effect, which holds constant the type of good sold (not shown).

I also examine whether providers adjust measures of transaction quality in response to shopper tribe or gender. As measured by correct dosages and whether the drug is of substandard quality, I find no evidence that providers adjust quality in response to the shopper tribe or gender (not shown). While 80 percent of vendors are female, I determine that male and female vendors respond to shopper gender in the same fashion, further evidence of statistical as opposed to taste-based discrimination (not shown).

IV. Conclusion

Using an audit study design, I find that women are offered higher prices for antimalarial drugs. Sellers show no animus towards minority tribal groups; minority tribe members pay lower prices than majority tribe members. I interpret these price differentials as consistent with statistical discrimination. However, because women are also more likely to successfully bargain for a discount, the final price paid does not differ by gender. These results suggest that measured discrimination is dependent upon whether one uses offer prices as opposed to completed transaction prices.

The result that men and women pay the same prices, but that women must spend additional effort obtaining that price has implications for policy. In particular, while results are consistent with the "Law of One Price,", the additional hassle of bargaining may make women worse off despite the lack of observed price differential. Standardizing price information by gender would potentially eliminate this effort cost, although would not likely change gender health disparities.

REFERENCES

Ayres, Ian, and Peter Siegelman. 1995. "Race and Gender Discrimination in Bargaining for a New Car." *American Economic Review*, 85(3): 304–321.

Becker, Gary. 1957. *The Economics of Discrimination.* University of Chicago University Press.

Castillo, Marco, Ragan Petrie, Maximo Torero, and Lise Vesterlund. 2013. "Gender differences in bargaining outcomes: A field experiment on discrimination." *Journal of Public Economics*, 99(C): 35–48.

Fitzpatrick, Anne. 2016. "Customer Information, Price, and Quality: Evidence from a Randomized Audit Study." *University of Massachusetts, Boston, Working Paper*, 1–43.

TABLE 1—SUMMARY STATISTICS

Variables	Female Shoppers (N=489) (1)	Male Shoppers (N=390) (2)	Diff (3)
Runyankole	0.487	0.549	-0.062
English / Other	0.219	0.082	0.137***
Luganda	0.294	0.369	-0.07***
Uncle	0.521	0.469	0.052
Weekend	0.419	0.426	-0.006
Afternoon	0.663	0.659	0.004
Had Baby	0.068	0.103	-0.035
Female Vendor	0.795	0.792	0.003
No Name Outside	0.393	0.413	-0.020
Visit Order	1.528	1.595	-0.067

Note: Sample is all transactions where the drug was tested (N=879). T-tests of mean differences conducted using an outlet fixed effects with standard errors clustered at the outlet level. $***p < 0.01, **p < 0.05, *p < 0.1$.

TABLE 2—PRICE RESULTS

	Price Offered (1)	Ln(Price Offered) (2)	Bargained (3)	Price Paid (4)	Ln(Price Paid) (5)
Female	0.331***	0.147***	0.367***	0.084	0.062
	(0.124)	(0.055)	(0.075)	(0.095)	(0.049)
Minority	-0.047	-0.019	0.155	-0.144	-0.051
	(0.169)	(0.068)	(0.105)	(0.142)	(0.065)
Female X Minority	-0.312*	-0.159**	-0.399***	-0.124	-0.094
	(0.189)	(0.077)	(0.113)	(0.156)	(0.073)
Constant	3.421***	1.141***	0.486***	3.100***	1.046***
	(0.110)	(0.044)	(0.070)	(0.091)	(0.041)
R-squared	0.913	0.744	0.83	0.911	0.677
Mean dep	3.211	3.419	1.061	1.782	0.452

Note: Sample is all transactions where the drug was tested (N=879). All regressions include controls for random assignment, patient, visit order as well as an outlet fixed effect. Robust standard errors in parentheses, clustered at the outlet level. There are 459 clusters. All prices are in US Dollars.$***p < 0.01, **p < 0.05, *p < 0.1$.

Goldberg, Pinelopi Koujianou. 1996. "Dealer Price Discrimination in New Car Purchases: Evidence from the Consumer Expenditure Survey." *Journal of Political Economy*, 104(3): 1–34.

Phelps, Edmund S. 1972. "The Statistical Theory of Racism and Sexism." *The American Economic Review*, 62(4): 659–661.