

ECONOMICS RESEARCH PAPER

# How pervasive is the pink tax: Evidence from the UK, UAE, and India

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# Introduction

Over the past few decades, there has been a growing awareness of how gender disparities permeate our economic lives. Some of the most blatant disparities, for example, the gender wage-gap or differentials in Executive and Board representation in corporations, have entered the cultural zeitgeist. National policies as well as organizational norms are slowly beginning to shift (or at least in some High-Income Countries ('HICs')).

But not all gender disparities are as well documented, understood, or have seen such progress. The Pink Tax ('PT'), a colloquial term referring to gender-based price disparity that occurs when products that are specifically marketed towards women are 'marked-up higher' compared to equivalent men's products, is one such omission. Essentially, PT captures the increase in the probability of a product being priced higher or even seen as more luxurious when marketed toward women (Duesterhaus et al., 2011).

PT is most common in the hygiene sector, although the empirical literature on the topic remains underdeveloped. While some sources suggest that PT may be as high as 37% (The Times, January 19th, 2016) others find little evidence that it exists (Sarah Moshary, 2023). There is also a lack of analysis examining whether or how PT might differ across income levels, either within or across countries.

PT has been evaluated in developed markets like the United States, where the difference in price points has been proven to be significant by authors like Duesterhaus et al. (2011) in the article "The cost of doing femininity: Gendered disparities in the pricing of personal care products and services", as well as Guittar et al. (2021), in the article "Beyond the Pink Tax: Gender-Based Pricing and Differentiation of Personal Care Products". But to date little academic analysis has taken a comparative, global market approach (and especially so for quantitative research).

This is a problem because more needs to be known about the existence of PT internationally; fair pricing is an important part of achieving gender equality. Yet there is such little evidence even documenting PT across countries despite it is not difficult to make hypothesis linking gender pricing to state capacity, education, or average income levels.

In this paper, we aim to ever-so-slightly extend the empirical literature on PT by providing a cross-country comparison of PT across products within the hygiene sector. We do this by collecting new cross-country data on personal care products such as soaps, lotions, razorblades and deodorants, product types for which we know PT is typically more prevalent (Feingold, 2022). We collect data for three countries (the UK, the UAE, and India), and our approach to estimating PT is to compare shelf prices for men and women for a given product from the same brand and the same retailer. For example, we compare the price of men's Gillette Razors from Sainsbury's in the UK against women's Gillette Razors from Sainsbury's in the UK. This helps reduce bias that might otherwise arise from comparing across countries and retailers. We also adjust for the quantity of goods within each product/package, as well as the existence of any sale/discount applied at the time.

Our analysis is comprised of three parts. In all parts we essentially use our sample to test whether there is evidence of PT for different groups, be they be by country/ brand/ product. First, we use our pooled sample to empirically examine the existence of PT across all countries, products, and brands, before investigating the existence of PT within India, the UK, and UAE, and then finally across brands.

Our results are as follows: first, pooling our data across all three countries and all product types we estimate an average PT of 30%, a concerning high-level finding. Looking at the data more granularly and across countries, we estimate large, positive, and statistically significant average PTs for India (44%) and the UAE (35%). We do not find meaningful evidence of a PT for the UK. While we do not have data or analysis on why some countries might have high PTs than others, anecdotally, it might reflect the increased gender inequalities in India or stem from the fact that there is a lack of consumer-based awareness in Low-Income Countries ('LICs'). People may also be less educated about gender inequalities and much less so about gender-based price disparities, which allows PT to perpetuate into the market and become a social norm.

Looking across brands, we find evidence that the average PT for Gillette is extremely high at 64%. This is a concerning finding and is worth consideration in future research. Other brands appear to have smaller and less

significant PTs. While we don't quantitatively estimate the PT by product due to data limitations, razors and other grooming goods do appear to be associated with larger PTs.

This study has some significant limitations. Firstly, for an accurate and fair product comparison, the products must be similar in how they're used, their consumption rates, and the markets they're sold in. However, finding adequately large and suitable sample markets is challenging, and this can exclude important product categories from the study.

Secondly, the size of the product sample might be too small to fully capture the differences in markets for products aimed at men versus those aimed at women. While there is a wide variety of women's products, such as soaps, makeup, and hair dyes, the variety in men's products may not be as extensive. This can lead to an incomplete representation of the market dynamics. Additionally, there might be subtle differences between the products being compared, despite them appearing similar. This can result in unfair comparisons and potentially flawed conclusions.

Despite these challenges, the study does provide insights into the extent of PT, particularly in hygiene products across various economic settings. However, the aforementioned issues could impact the reliability of the findings.

The rest of this thesis is outlined as follows. Section 2 describes the background. The data used in the empirical part is presented in Section 3. Section 4 provides empirical results. Finally, Section 5 concludes.

# Background

The phenomenon of women facing higher costs for essential products compared to men is pervasive across various sectors, including hygiene, clothing, and automotive. In the hygiene industry, elevated prices for feminine products are often attributed to "pink marketing" strategies, wherein companies market 'pink' products specifically towards women and mark up prices due to additional costs associated with targeted advertising.

Similarly, in the automobile repair sector, pricing disparities have been observed, with women potentially being overcharged based on perceived lack of knowledge about vehicles and associated parts (Machelett, 2019). However, it is crucial to recognize the existence of non-price implicit gender taxes that women must bear, with the costs of feminine hygiene products at the forefront; on average, a woman will purchase approximately 8,200 sanitary pads over her lifetime (Johnson, 2019); and studies have shown that women pay an average of £200 more per year than men for hygiene products, with items marketed towards women being 37% more expensive on average across a range of gender-targeted products (The Independent, 2022).

## 2.1 Why we should care about PT?

The topic of PT raises critical questions regarding discrimination and social injustice. The pervasiveness of PT may serve as an indicator of deeply ingrained gender inequities. The imposition of higher prices on women's products on the basis of gender goes against the fundamental principles of fairness and equality. The perception that women's products are inherently more luxurious or that females are intrinsically "high-maintenance" is a false and poor justification for pricing disparities. Functionally comparable products, identical in composition and manufacturing processes, should not exhibit any price discrepancies, regardless of superficial variations in fragrance or aesthetics. While factors such as brand equity may play a role in pricing strategies, it is important to recognize that these differences are unjust.

In the US, for every dollar a man earns, women earn only 83 cents (Iacurci, 2022). The gender wage gap remains a troubling reality, with women consistently earning less than their male counterparts for the same work. Not only does this affect women's financial stability, but it also exacerbates economic inequality. On top of that, PT means that women also have to spend a greater proportion of their income for the same services, simply because they are marketed as female or designed with 'feminine' qualities. This renders women with even less disposable income to allocate towards essential requirements or personal advancement.

Addressing PT is thus necessary to advance social justice, as it entails the dismantling of discriminatory practices and advocates for policies promoting the equitable treatment for all consumers, regardless of gender. By confronting PT, we can confront larger questions of social justice and create a more inclusive and equitable society.

## 2.2 PT policy across countries

Many countries within North America and Europe have passed laws prohibiting PT. For example, in the US, the Department of Consumer Affairs issued more than 580 violations in 2011 to businesses for using gender-based pricing strategies (OC Ferrel, 2015). The European Union created legislation directing that both genders 'should have equal access to goods and services'. This, in turn, has forced many businesses to adopt equal prices for the same products for both men and women.

However, most other countries are far behind in institutionalising such fair pricing practices. Australia and the UK, among others, have conducted investigations into PT and its impact on consumers. Other governments have failed to create appropriate legislation prohibiting gender discrimination and resigned to relying on businesses to eliminate gender-based pricing disparities (India, France and Canada). As expected, businesses have little incentive to do so.

## 2.3 Theoretical underpinning of PT

In theory, there are several reasons why the PT might exist: women exhibiting inelastic demand compared to men; women opting for products from markets where there is less competition relative to men's products; or women favoring products characterized by higher marginal costs (Kayleigh Barnes, 2022). It is also important to observe demand and supply mechanisms that may result in women paying more than men for similar products. Since women's consumption of products in the hygiene sector is less elastic than men, firms markup prices in order to maximize profit (Kayleigh Barnes, 2022). There are also more practical reasons that might underpin a PT. Firms could be marking up prices to justify higher marketing and packaging costs associated with women's products; anecdotally, women are more likely to spend more on hygiene products, and firms might create better marketing and packaging to incentivize purchases.

## 2.4 Empirical debates of the PT

There is some disagreement in the literature regarding the existence of PT. Some sources argue that PT is a result of differing product attributes or consumer preferences (between men and women) rather than direct gender discrimination (Schmidt, 2021) whereas many others argue that there is strong evidence of a gender based price disparity (Machelett, 2019).

Empirically, there is some evidence for the existence of a PT. Sources find that the PT exists across various products and continues to persist in society, contributing to gender disparities (Nandini Sanadhya, 2022). Many other papers also present strong evidence confirming the existence of a PT (see, (Katz, 2016),(Stephanie Gonzalez Guittar, 2022)(Lafferty M. )). The State of California also did a study on PT, claiming that women had an annual gender tax of US\$1,351 for the same goods/services as men (California Assembly Office Of Research, 1994).

Despite this, there is not a clear consensus in the literature. Moshary (Sarah Moshary, 2023) finds that, when using a national set of mass merchandiser sales data that explore large price differences between men and women's products (by the same merchandiser), PT does not appear to exist.

## Data

In this paper, we will be using a narrow definition of PT that specifically examines the price differentials between products in the hygiene sector. We concentrate on the hygiene sector given the strong evidence of PT in the literature and the extensive use of gender-based marketing and the ability to easily differentiate women's products from men's products. Our definition is consistent with that of existing literature (Natasha Bhatia, 2021) (Lafferty M., 2019).

To assess the scale of PT, we collected product price and quantity data across 3 countries (India, the U.A.E and the UK) for 3 commonly used hygiene products used by both men and women: shampoo, razors and soap. Given the large variety of each product type, we chose to collect data by brand and product subtypes, i.e. disposable vs reusable razorblades, shampoos, facewash, hair colour etc. We gathered data from two types of storefronts: online and in person but only matched products within brands and within storefronts.

We took several steps to limit bias in our data collection and analysis. First, we chose to compare similar products sold from the same company and store type to account for cross-company business model variation. Second, to limit any urban vs. rural dynamics, we collected data only from the larger and more populous cities within each country. Third, to account for sales/ promotions/ discounts occurring at the time of data collection in our analysis and the fact that these may systematically differ across gender, we noted down both the price and sale discount. Finally, by providing data on the quantity of a product (e.g. the number of razors in a box or the weight of soap), we also provide results that can adjust for product quantity.

Our empirical results reply on the following three formulas for calculating the PT:

$$\text{Unadjusted Pink Tax}_{ijkl} = \frac{\text{women's price}_{ijkl} - \text{men's price}_{ijkl}}{\text{men's price}_{ijkl}} \cdot 100$$

$$\text{Quantity Adjusted Pink Tax}_{ijkl} = \frac{\frac{\text{women's price}_{ijkl}}{\text{women's quantity}_{ijkl}} - \frac{\text{men's price}_{ijkl}}{\text{men's quantity}_{ijkl}}}{\frac{\text{men's price}_{ijkl}}{\text{men's quantity}_{ijkl}}} \cdot 100$$

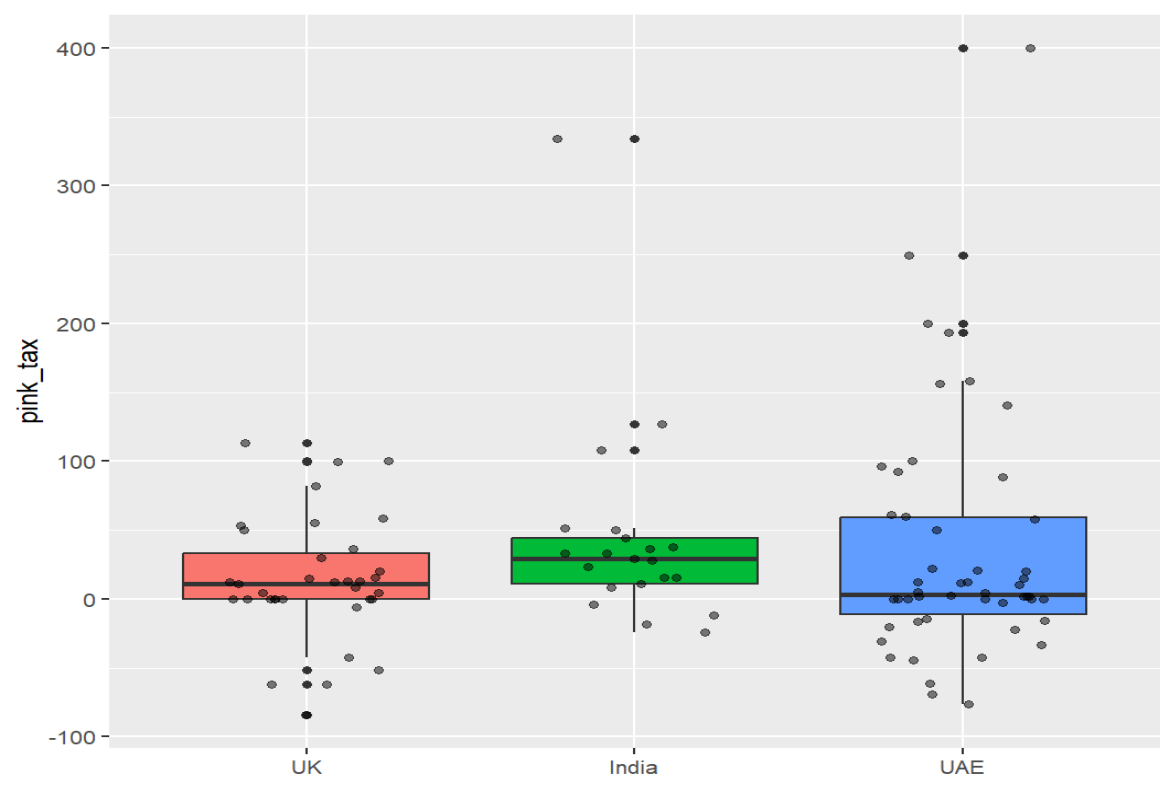
$$\text{Quantity and Sale Adjusted Pink Tax}_{ijkl} = \frac{\frac{\text{women's price}_{ijkl}}{\text{women's quantity}_{ijkl}} \cdot \frac{1}{d_{f,ijkl}} - \frac{\text{men's price}_{ijkl}}{\text{men's quantity}_{ijkl}} \cdot \frac{1}{d_{m,ijkl}}}{\frac{\text{men's price}_{ijkl}}{\text{men's quantity}_{ijkl}} \cdot \frac{1}{d_{m,ijkl}}} \cdot 100$$

In each of these, *women's price<sub>ijkl</sub>* is the price for a women's product for good i, from brand j, from store k, from country l. This price grosses up any sale discounts applied at the time. Variable definitions are the similar for men's products and product quantities. In the final equation, sales discounts applying at the time of data collection are adjusted via *d<sub>m,ijkl</sub>*, the discount percentage compared to the normal price.

We collected a total of 107 matched paired product prices across all three countries, in store and online. In Figure 1 below, a simple box and whisker graphic, shows the distribution of unadjusted PT data collected across the 3 countries. Table 2 and 3 provide the summary statistics by product and by country.



Figure 1: Distribution of PT % by Country



Note: Y-axis is in percent. A 0 on the y-axis indicates that there is no difference in pricing between men and women. Pink\_tax provides the quantity and sales adjusted PT estimate.

# Empirical Approach

In this section, we investigate whether there is evidence of PT in our sample when analysing across countries, products, and brands. We begin at the most aggregated level examining all countries and products together (i.e., using a pooled sample), before examining across countries and brands. Across all the analysis (i.e., groupings within the data), we use very simple regression models to examine whether there is evidence that the average value of the PT is different to zero for that group.

## 4.1 Evidence of PT in the pooled sample

We begin by estimating the value of PT in our pooled sample. The aim is to see whether there is statistical evidence that the average value of PT is greater than zero if we pool across all countries, brands, and good types. We do this using a simple regression approach, estimating:

$$Pink\ Tax_{ijkl} = \alpha_0 + \varepsilon_{ijkl}$$

Where  $Pink\ Tax_{ijkl}$  is our main PT variable,  $\alpha_0$  is the estimate of the average PT pooled across all countries and products, and  $\varepsilon_{ijkl}$  is the error term. Our null hypothesis is that  $H_0: \alpha_0 = 0$ , i.e., that there is no evidence of a positive PT in the sample

Below, in Table 1 we present regression results. We do so across three variations of the PT: discount and quantity adjusted, only quantity adjusted, and unadjusted.

Table 1: Simple Averages Regression Results

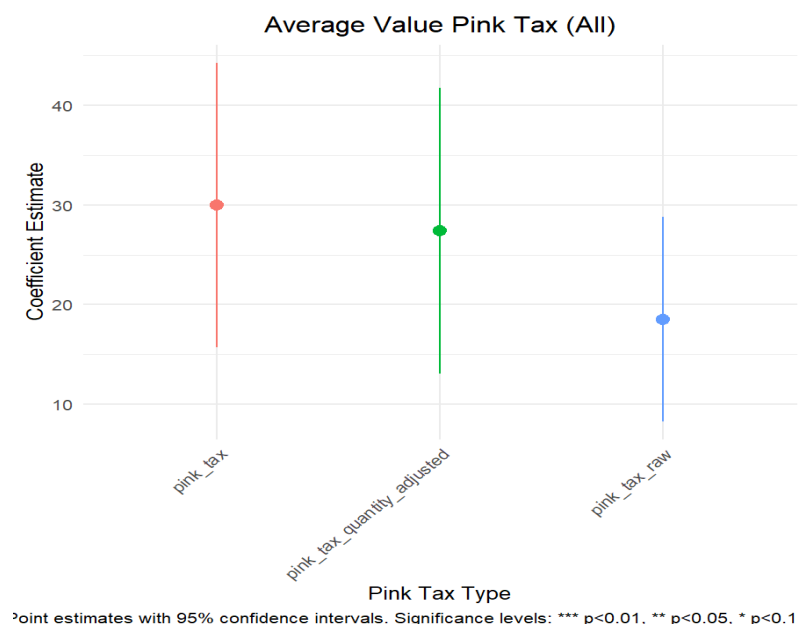
	Pink Tax (Discount and Quantity adj.)	Pink Tax (only Quantity Adj.)	Pink Tax (Unadjusted)
Coefficient			
(Average PT Estimate)	30.011***	27.406***	18.521***
std.error	(7.205)	(7.230)	(5.170)
Num.Obs.	106	107	107

Note: \*p>0.9 \*\*p>0.95 \*\*\*p>0.99

Based on the results, we can reject the null hypotheses of no PT, as women’s products are on average priced higher than men’s products, and statistically significantly so. The above table shows that women’s products are priced 30% higher than men’s on average when factoring in discounts and quantity adjustments. When only considering quantity adjustments, there is still evidence of a PT of 27%. This decreases when looking at an unadjusted version of PT, but ultimately there is a clear indication of PT across all three datasets. All the estimates of the PT are statistically significant (intuitively, the standard errors are quite small compared to the estimates of the PTs).

Figure 2 provides these results with a 95% confidence interval.

Figure 2: Pooled Estimates of PT



## 4.2 Evidence of PT across countries

Next, we examine the data at a country level, to determine the prevalence and extent of the PT across countries. To do so, we use a simple factor variable or dummy variable approach to isolate average level of PT by country. Specifically, we estimate:

$$Pink\ Tax_{ijkl} = \beta_k + \varepsilon_{ijkl}$$

Where  $Pink\ Tax_{ijkl}$  are our main PT variables,  $\beta_k$  are estimates of the average PT per country, and  $\varepsilon_{ijkl}$  is the error term. Our null hypothesis is that  $H_0: \beta_k = 0$ , i.e., that there is no evidence of a positive PT for each country in the sample.

While we don't formally test for the difference between countries, but Table 2 shows us that we can reject the null hypothesis of no PT for India and UAE (but not for the UK).

Table 2: Simple Averages Regression Results Across Countries:

Country	Statistic	Pink Tax (Discount and Quantity adj.)	Pink Tax (only Quantity adj.)	Pink Tax (Unadjusted)
UK	Avg. est	14.245	13.360	4.650
	std.error	(12.503)	(12.469)	(8.445)
India	Avg. est	44.154***	35.744**	54.910***
	std.error	(16.141)	(16.326)	(11.057)
UAE	Avg. est	35.106***	34.017***	13.225*
	std.error	(10.460)	(10.580)	(7.166)
Num.Obs.		106	107	107

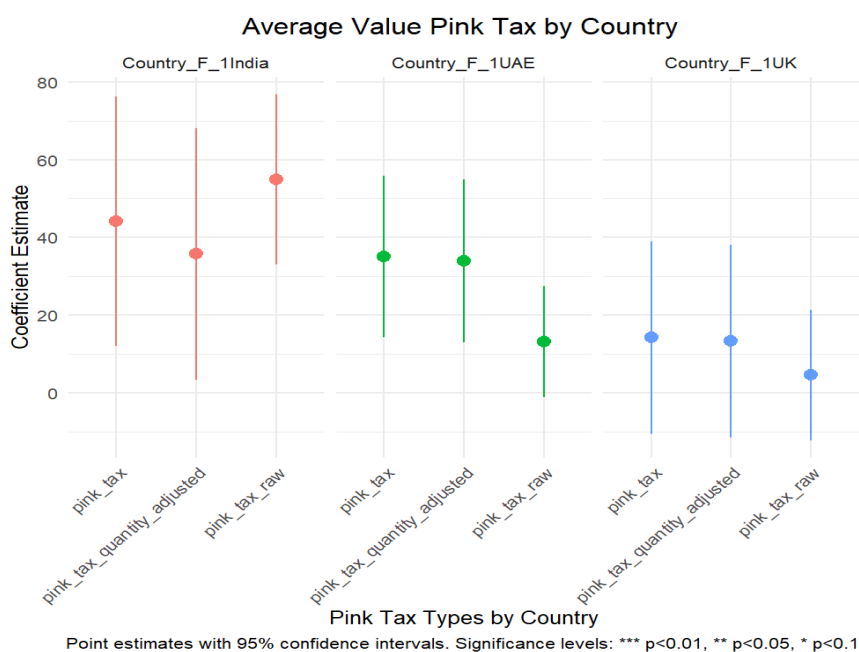
Note: \*p>0.9 \*\*p>0.95 \*\*\*p>0.99

For India, we found that women’s products, taking in discounts and quantity adjustments, were 44% more expensive than men’s products in India. The unadjusted PT in India was 54%, and PT adjusted for quantity only was 36%. All three results for India are statistically significant, giving us some confidence that the PT does exist in India (even if it is less than found in our sample).

In the UK, we cannot say for certain whether the PT exists or not (we cannot reject the null hypothesis that there is no PT), as evidenced by the non-significant results in Table 2. While our data shows that there is evidence of higher prices on average for women’s products, we cannot be certain that this is not a sampling error or an error of chance.

We find that a relatively high PT exists in the UAE. Unadjusted, women’s products were being priced 13% higher than men’s, but when taking into account quantity, this difference rose to 34%, and when taking both quantity and discounts into account, it rose to 35%. The two latter results are significant, giving us confidence that the PT does exist in the UAE and our results are not occurring by chance.

Figure 3: Country Estimates of PT



### 4.3 Evidence of PT across brands

Our dataset captures product types by brand. We now test for evidence of the PT across the three of the most common brands in our dataset: Garnier, Gillette and Nivea (and a group capturing the rest of the brands). We used the following equation:

$$Pink Tax_{ijkl} = \beta_j + \varepsilon_{ijkl}$$

Where  $\beta_j$  is an estimate of the average PT per country, and  $\varepsilon_{ijkl}$  is the error term. Our null hypothesis here is that  $\beta_j = 0$ , i.e., that for each brand there is no PT.

Table 3 shows the results.

Table 3: Regression results when controlling for Brand

Brand		Pink Tax (Discount and Quantity adj.)	Pink Tax (only Quantity adj.)	Pink Tax (Unadjusted)
Other	Avg. est	35.937***	34.275***	32.772***
	std.error	(12.971)	(12.966)	(9.447)
Garnier	Avg. est	-13.512	-15.473	64.350***
	std.error	(26.400)	(26.392)	(19.229)
Gillette	Avg. est	64.311***	63.998***	19.858**
	std.error	(12.159)	(12.155)	(8.856)
Nivea	Avg. est	3.008	-1.716	-1.958
	std.error	(11.483)	(11.327)	(8.253)
Num.Obs.		106	107	107

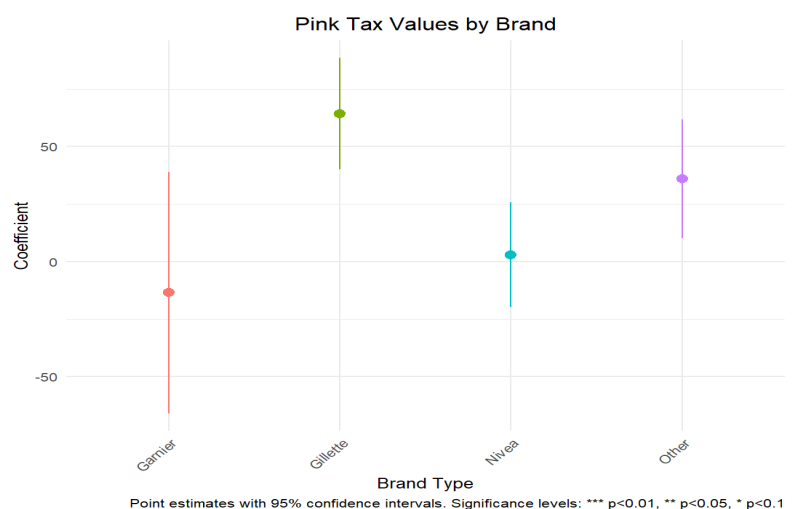
We found that Gillette had the highest adjusted PT of 64%, almost double that of the others. This slightly decreased to 63% when accounting for quantity of items only, but when using an Unadjusted PT, it dropped dramatically to 19%. This implies that Gillette’s pricing for men’s and women’s products might not seem too different when just comparing nominal prices, but when we adjust for per unit price and discounts, their pricing strategy is clearly different for men’s and women’s products. We do not see such drastic changes for Nivea and the rest of the market, but we do see an interesting result (albeit in the opposite direction) result for Garnier. We find that while Garnier’s unadjusted prices show a significant PT, but, in reality, when adjusted for discounts and quantity of items, there is no evidence of PT; in fact, in some cases, men’s items may be priced higher than women’s (i.e. a negative PT).

For Nivea, their prices do not seem to be significantly different for men and women’s items, i.e. there is no discernible PT in this case.

The ‘Other’ category (‘Others’) was made of all other less frequent brands, compiled together. The data shows that there is a significant PT in the broader Others market, ranging from 32-35% across adjusted and unadjusted data.

Overall, we find that Gillette evidently showcased the largest extent of PT, closely followed by the broader Others market. Now, it is important to remember that not all brands provide products of all types. For example, Gillette is primarily involved in grooming products and not soaps. It is this product view that we look at next.

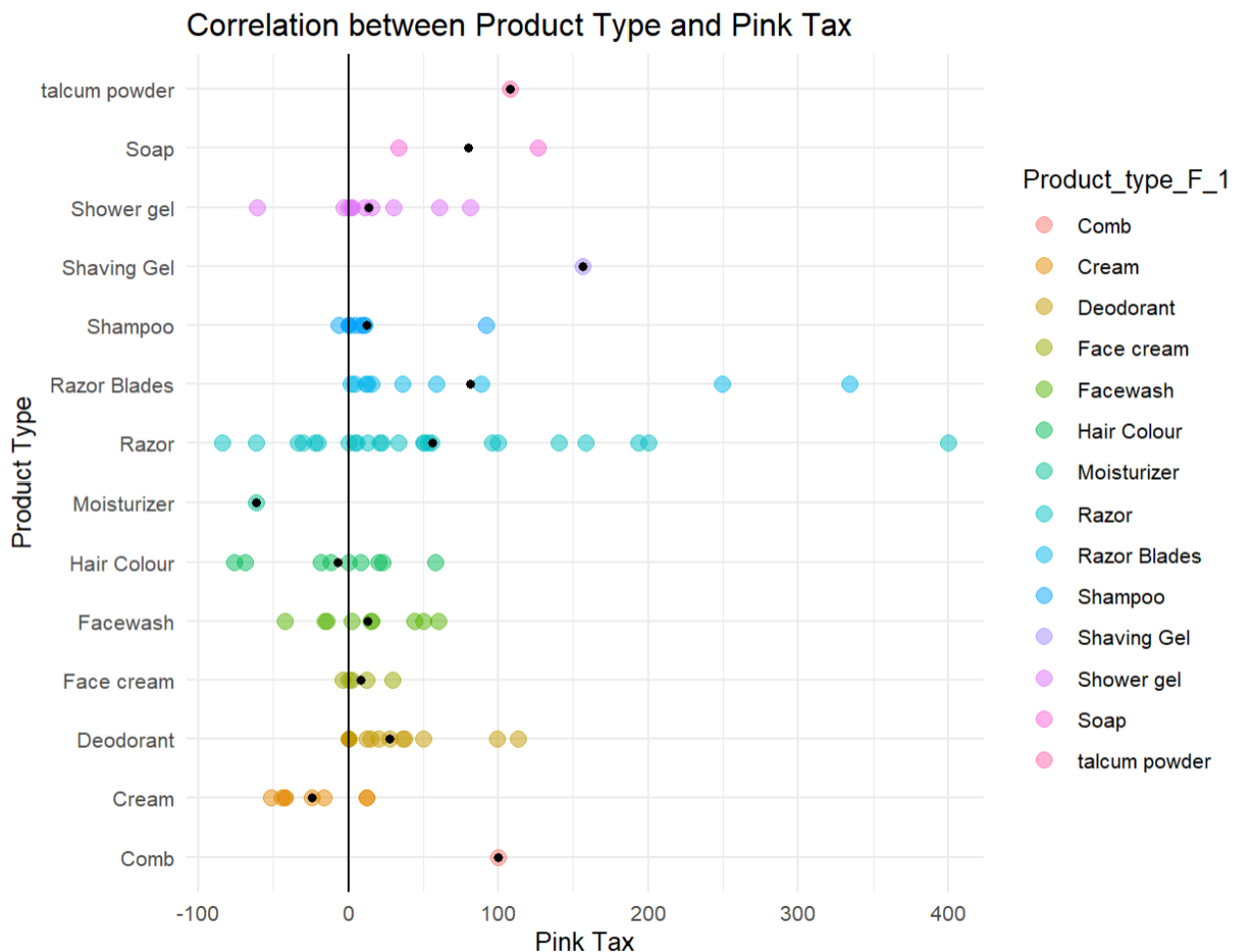
Figure 4: Average Value of PT by Brand



## 4.4 Evidence of PT across product types

Finally, we analysed the data by product type to understand whether PT was more prevalent for specific products or was more pervasive in the market. Unfortunately, there was not enough data for each product type to undertake formal and meaningful statistical analysis. Nevertheless, Figure 5 shows that the PT may very well exist for a few product types (for Razors and Razor blades) while there is an indication that some other products may exhibit PT too (e.g., Deodorant, Shampoo, and Shower Gel). Future research is needed to better unpick the details of PT across brands and products.

Figure 5: Product types and PT



Note: Each dot is a datapoint for a given product.

## Conclusion

We find evidence of price discrimination by gender for hygiene products in at least 2 of the 3 countries in our sample, one HIC (UAE) and one LIC (India). While we did not find significant evidence of a PT in the UK, the data in our sample does show higher prices on average for women's products. Although this paper does not provide comprehensive evidence on the nature and causes of differences in the PT across countries and products, our results do indicate that this is an important area for further study. At the least they might imply that there is a lack of consumer-based awareness in LICs. People could be less educated about gender inequalities and much less so gender-based price disparities, which allows PT to perpetuate into the market and become a social norm.

We also find evidence of certain brands perpetuating the PT problem. Among the brands analyzed, Gillette stood out as having the highest PT. This highlights the need for companies to recognize the role they play in furthering gender discrimination and taking proactive steps to practice equality. While our simple study was not equipped to comment on the relationship between the PT, brands, and product types, companies like Gillette, who appear to have high PTs, do need to be held accountable and encouraged to adopt a more equitable pricing structure.

However, companies do not currently have sufficient incentive to police themselves. As a result, legislative action is likely required in the short term to put an end to the discriminatory prices for essential products.

At the same time, consumers (especially women) need to be more aware that they are being taken advantage of, and are being forced to pay more for necessary hygiene items. Public pressure has shown to affect change in many socio-economic issues – similar pressure here could persuade governments and companies to act.

While this research focused only on hygiene products in select countries, further, in-depth research is required across more product segments, countries, and socio-economic outcomes (especially female empowerment outcomes), to pinpoint the extent to which PT impacts women's lives.

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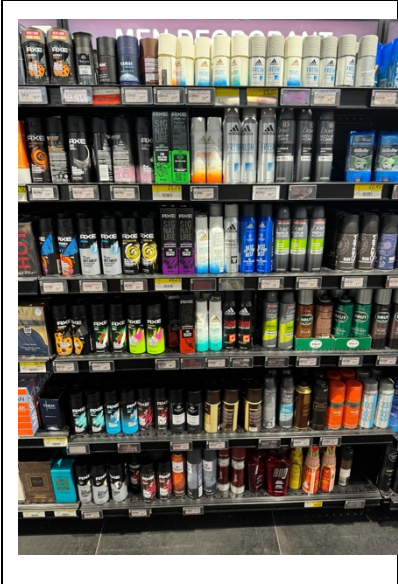
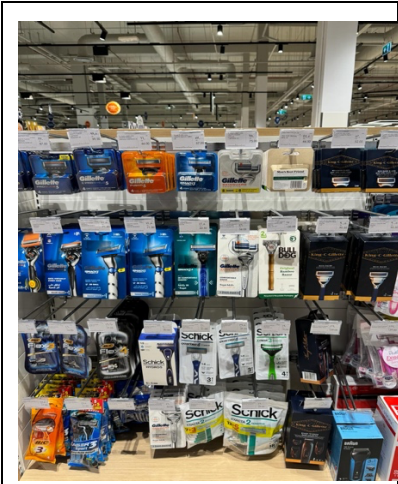
## Appendix: Data sources

 UNITED KINGDOM



 UNITED ARAB EMIRATES





Kunal General Store – BHOPAL

