

# Protectionism and Gender Inequality in Developing Countries

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## Abstract

How do tariffs impact gender inequality? Using harmonized household survey and tariff data from 54 low- and middle income countries, this paper shows that protectionism has an anti-female bias. On average, tariffs repress the real incomes of female headed households by 0.6 percentage points relative to that of male headed ones. Female headed households bear the brunt of tariffs because they derive a smaller share of their income from and spend a larger share of their budget on agricultural products, which are usually subject to high tariffs in developing countries. Consistent with this explanation, the anti-female bias is stronger in countries where female-headed households are underrepresented in agricultural production, more reliant on remittances, and spending a comparatively larger share of their budgets on food than male-headed ones.

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After decades of progressive globalization, spurred in part by trade tariff liberalization, protectionism is on the rise. Tariff protection boosts nominal incomes by raising urban and farm profits as well as wages. But protection also results in higher prices, which increase the cost of living and hurt consumers. Since tariffs vary across goods, and because households have different sources of income and spending habits, trade protection has highly heterogeneous welfare impacts across the rich and the poor, across urban and rural households, across workers in different sectors and with different skills, and across women and men.

This paper examines whether tariff protection exacerbates gender inequality in real incomes because of differences in the extent to which tariffs impact the earnings and the cost of living of male and female headed households. We combine tariff and household survey data from 54 low and middle income countries. These are countries with important gender differences and high protection. We quantify the level of tariff protection and we establish differences in the sources of income and expenditure across female-headed and male-headed households. We first document that developing countries still levy substantial tariffs, both on manufacturing and agricultural goods. In turn, female-headed households are under-represented in agricultural production and spend a greater share of their budget on food purchases than their male-headed counterparts. As a consequence, female-headed families are hurt more by tariffs. In 42 of our 54 countries, protectionism has an anti-female real income bias, which exacerbates gender income inequality.

## ~~Data~~

To quantify the anti-female bias of trade policy, we harmonize data on incomes and  
  
and men.

from the sales of the same 53 food items we cover on the expenditure side, as well as from wage income across 10 sectors, non-farm household enterprise sales across 10 sectors, and various types of transfers. The household surveys are harmonized with detailed tariff data from WITS, the World Integrated Trade Solution. For each product classification in the household surveys, we calculate the average tariff from WITS, using import value shares as weights.

With these very granular data, we assess the implications of the structure of tariff protection on the real income of female- and male-headed households in each of the 54 countries separately. To calculate the welfare effects of tariffs for different households, we rely on the seminal work of Angus Deaton (2). This methodology builds on the observation that the real income of a household is a function of nominal income and a household-level cost-of-living price index. The nominal income is the sum of earnings from the different activities identified in the surveys, namely agricultural income, wages, family businesses and transfers. We can thus write  $Y^h = \sum_j a_j^h(p_j)$ , where  $a_j^h$  is the income derived from activity  $j$  by household  $h$ . Incomes depend on tariffs  $\tau_j$  via prices. The cost-of-living for a household  $h$  can likewise be represented by the sum of expenditures in different goods  $s_i^h$ , so that  $E^h = \sum_i p_i s_i^h$ . The cost of living is also a function of tariffs  $\tau_i$  through prices. Following Deaton, the proportional change in welfare induced by tariffs  $\tau$ ,  $\psi^h$ , can be expressed as

$$(1) \quad \psi^h = \sum_j \alpha_j^h \tau_j - \sum_i \beta_i^h \tau_i$$

where  $\alpha_j^h$  is the share of total nominal income that each household derives from activity  $j$  and  $\beta_i^h$  is the share of total household expenditure allocated to good  $i$ . Tariff protection increases producer and consumer prices. Assuming full price transmission, the proportional increase in prices is given by the extent of the tariff itself. The increases in the producer price raises nominal income, given the income shares  $\alpha_j^h$ . This leads to (income) gains in household welfare. Yet higher tariffs and prices also increase the cost of living, given the expenditure shares  $\beta_i^h$ . This leads to (consumption) losses in household welfare.

In the end, the net effect of protectionism depends on the income and expenditure

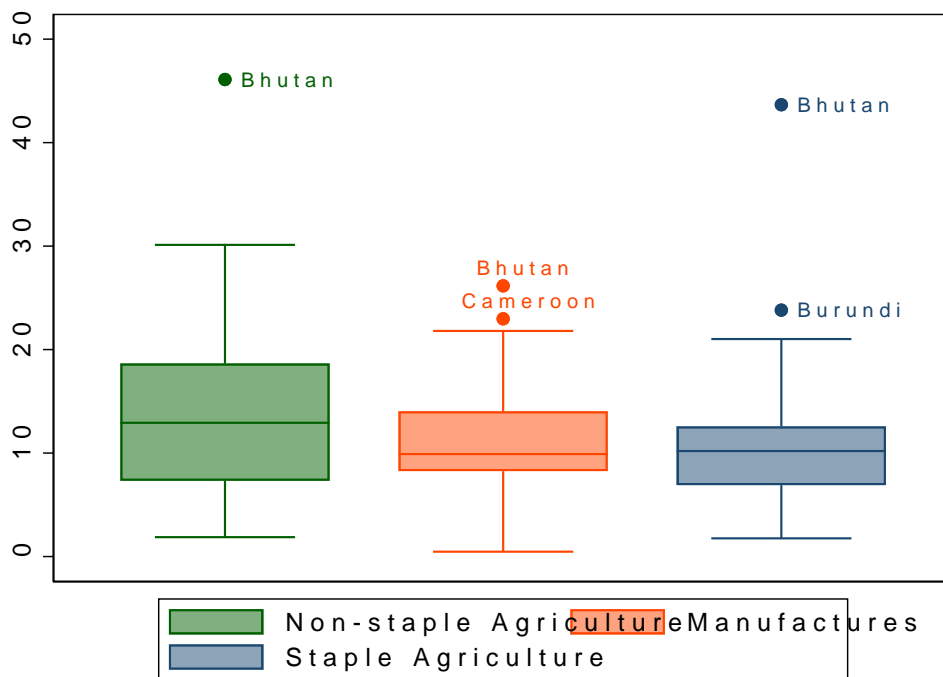
patterns of the different households. These welfare effects are consequently heterogeneous. Net producers gain from protection, and their gains intensify when the income gains are larger and the consumption losses are smaller. Net consumers, by contrast, lose from protection, and these losses intensify when the income gains are small and the consumption losses are larger. Since female-headed households earn their incomes from different sources than male-headed households (that is, they have different  $\eta$  in the data) and since both sets of households consume different bundles of goods (that is, they show different  $\epsilon$  in the data), the consequences of tariffs will be heterogeneous across these two groups. We can thus quantify the female bias of protectionism by calculating the difference between the welfare effects for female-headed relative to male-headed households (similar in spirit to the poverty bias index of Nicita et al. (3)). The female-bias of protectionism index thus measures how much more female-headed households gain from trade than male-headed ones.

## **FAITB 0**

### **5h**

Tariff protection, even after many rounds of multilateral and regional trade agreements, remains relatively high in our sample: based on data from the World Integrated Trade Solutions, Trade Analysis and Information System (WITS-TRAINS), the average tariff on non-staple agricultural goods is 14.4 percent, on staple agricultural goods is 10.8 percent, and on manufactures, 10.9 percent. Figure 1 shows that these averages mask substantial variation in trade barriers across countries. Average tariffs on non-staple agricultural goods range from as high as 46.1 percent in Bhutan to as low as 1.9 percent in Indonesia. Countries with higher tariffs in agriculture (staple and non-staple) tend to have higher tariffs on manufactures as well. There is also significant variation in tariffs across the different products in our data, especially in agriculture. Sri Lanka, for example, levies a 125% tariff on cigarettes, while in Jordan the tariff on beer is 200%.

Figure 1  
Tari Protection Across the Developing World

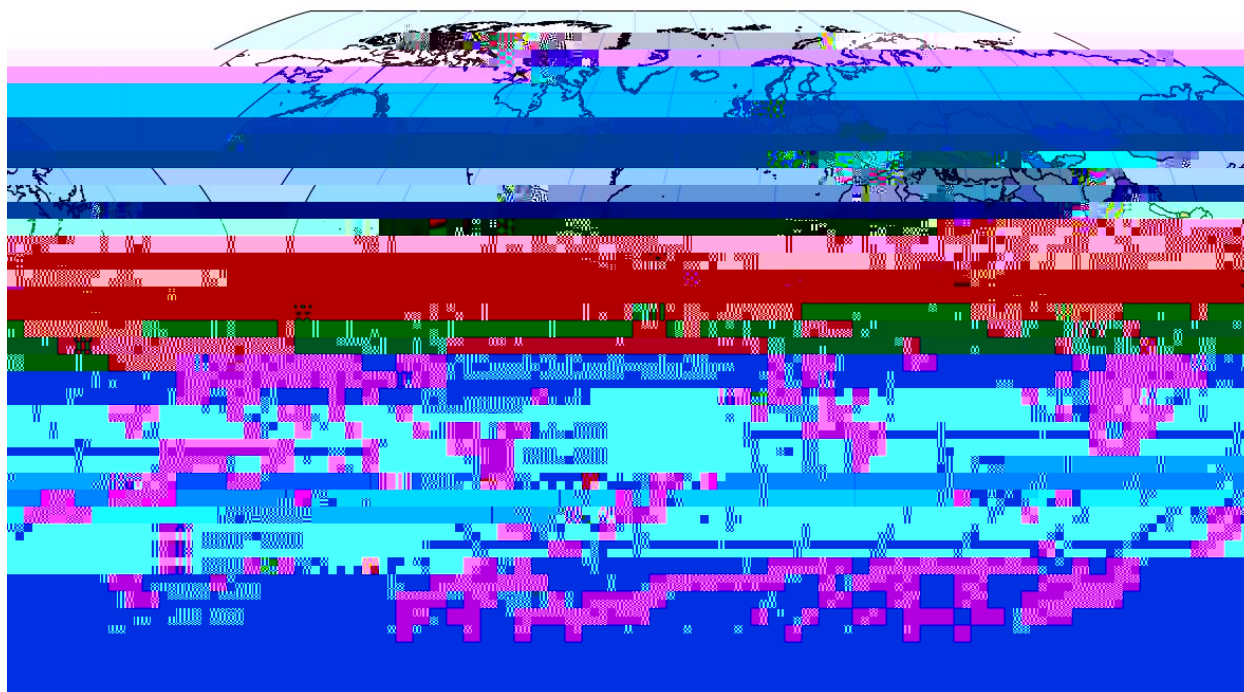


Notes: Data come from the World Integrated Trade Solutions, Trade Analysis and Information System (WITS-TRAINS). The figure is a box-plot depicting variation in average tariffs by broad product category across countries. The box represents the interquartile range, with the line in the middle depicting the median average tariff across countries. Dots represent outliers.

## BAIFB

The main finding of this paper is that the tariff protection of developing countries creates a gender bias in trade policy: In our sample, tariff protectionism is anti-female in 42 out of 54 countries. The level and intensity of the gender bias are illustrated in Figure 2. In the map, more intense shades of violet mean more intense anti-female bias. Countries with pro-female biases are plotted in shades of orange.

Figure 2  
The Gender Bias of Tariff Protection Across the Developing World



Notes: world map of the female bias of tariff, which measures how much more female-headed households gain from tariffs than male-headed ones, expressed in percentage of household-status quo expenditure. Countries with anti-female trade protection are plotted in violet, with more intense shades of violet indicating more intense anti-female bias. The few countries with pro-female bias are plotted in shades of orange.

The gender bias is presented in Table 1 for the 42 countries with an anti-female bias. At 2.5 percent, the most negative female bias is estimated in Burkina Faso. This bias means that female-headed households lose 2.5 percent more than male-headed households in terms of their economic well-being. In particular, women lose 3 percent from protection but men lose less, 0.5 percent. We find similar patterns in other African countries, such as Cameroon,

Mali and The Gambia, where the bias is 2.2 percent. This pattern also generalizes to other continents. In Nicaragua, for instance, the female bias is 2.1 percent; in Uzbekistan, it is 1.5 percent; in Vietnam, 1.2 percent; and in Bangladesh, 1.2 percent. All the anti-female biases are statistically significant at 1 percent level, except for Azerbaijan which is significant at 5 percent level.

In the remaining 12 countries, there is a pro-female bias instead. These are shown in Table 2. In Benin, for example, the bias is 2.2 percent and it is the result of higher losses for males (4.0 percent) than for females (1.8 percent). Note that the pro-female bias is actually low in most cases. It exceeds 1 percent only in Bhutan, Uganda and Benin. Moreover, the pro-female bias is statistically significant in only 6 of the 12 countries. Together, these results illustrate the ubiquity of an anti-female bias: the bias is in general negative and highly statistically significant; when it is positive, it tends to be very small in magnitude and often not statistically significant.

These differential impacts on household well-being exacerbate gender inequality. Across countries in our sample, the real income of male-headed households is 2.6 percent higher, on average, than the real income of female-headed households. Tariff protection contributes to 0.6 percentage point out of this 2.6 percent difference. This means that, worldwide across poor and low middle-income countries, protectionism accounts for about a fourth of the status-quo gender income inequality.

## **VI**

Why does this happen? The anti-female bias occurs because tariffs affect households both as consumers and as income earners and there are inherent differences in the income sources and spending patterns of male and female headed households. This creates a "female nominal income bias of trade policy" and a "female cost-of-living bias of trade policy."

## **VIa**

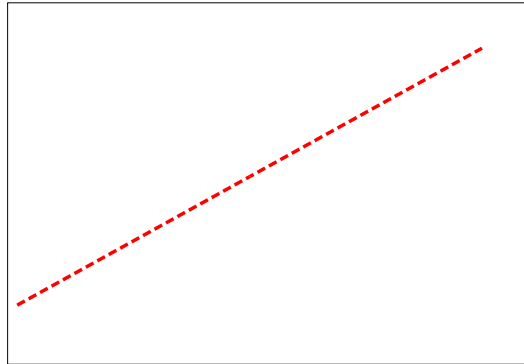
The "female nominal income bias" of trade policy occurs because tariff protection raises the incomes of females relatively less than the incomes of males. The magnitudes of the nominal



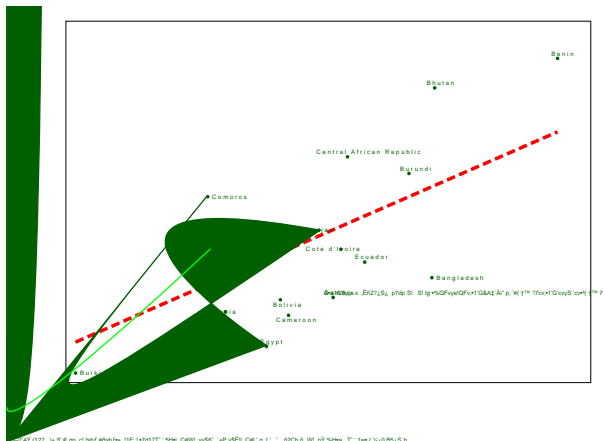


Figure 3  
The Gender Bias and the Nominal Income Gender Bias

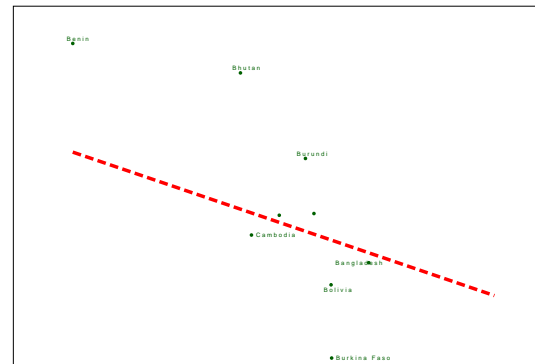
(a) the nominal income female bias



(b) market agricultural income



(c) remittances and transfers



Notes: Panel a): plot of the total female bias of trade policy against the nominal income bias of trade policy. The total female bias measures how much more female-headed households gain from tariffs than male-headed ones, expressed in percentage of household-status quo expenditure. The female nominal income bias measures how much more female-headed households gain from tariffs than male-headed ones as producers, expressed in percentage of household-status quo expenditure. Panel b) plots the nominal income bias against the relative exposure of females to market agricultural income (the difference in the share of market agricultural income for female- relative to male-headed households). Panel c) plots the nominal income bias against the relative exposure of females to remittances and other transfers (the difference in the share of remittances and transfer income for female- relative to male-headed households).

agricultural work (5). As pointed out by Alessina, Giuliano and Nunn (7), these explanations often interact with each other. Culture and social institutions combine with the strenuous labor requirements of agriculture to further limit female labor participation. In addition, there is evidence that the need to utilize non-labor inputs up-front such as seeds, fertilizers and pesticides often imposes additional barriers to female participation (because of credit constraints and insufficient productive assets). This happens in commercial staple agriculture and, especially, in non-staple agriculture such as cotton or tobacco (8).

Another (complementary) explanation is that female-headed households are more reliant on remittances and transfers. Indeed, Appleton (9) shows that higher remittances receipts in female-headed households have been instrumental in preventing increases in gender inequality in Uganda (see also (10)), while Amuedo-Dorantes and Pozo (11) show that remittances adversely affected female but not male labor force participation in Mexico. We find evidence consistent with their hypothesis in the context of trade policy. Panel c) of Figure 3 presents a scatter plot of the nominal income bias of tariff protection (as before) and the bias in exposure to remittances and other transfers from relatives and friends (that is, the differences between the share of income derived from remittances and transfers between female- and male-headed households,  $r^f - r^m$ ). Unlike the case of agricultural income, we observe that when female-headed households are more exposed to remittances and transfer income, the anti-female bias of trade policy is amplified. This is consistent with the notion that women as income earners enjoy less protection from trade policy than males because of a higher reliance on remittances and transfers.

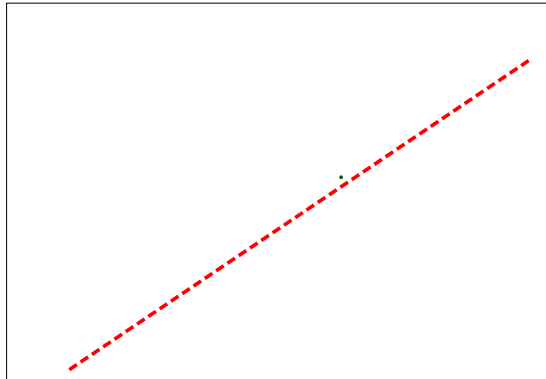
## Results

There is also a negative "female cost-of-living bias" of trade protection: tariffs raise consumer prices and the cost of living for female-headed households more than the cost of living for male-headed households. As consumers, females thus lose more from tariff protection than males (see columns 7-9 of Tables 1 and 2). The cost-of-living bias is strong as well. As shown in panel a) of Figure 4, the correlation between the female cost-of-living bias and the overall female bias is 0.69: countries with larger anti-female cost-of-living biases are

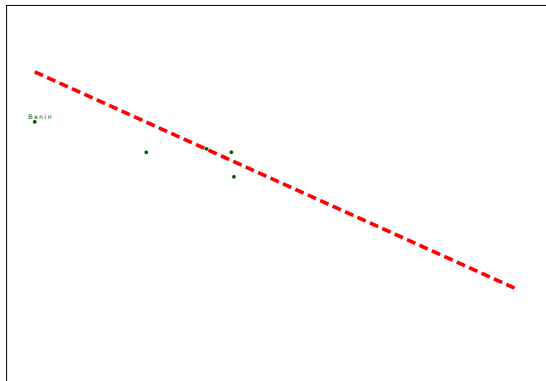


Figure 4  
The Gender Bias and the Cost-of-living Gender Bias

(a) the cost-of-living female bias



(b) agriculture expenditures



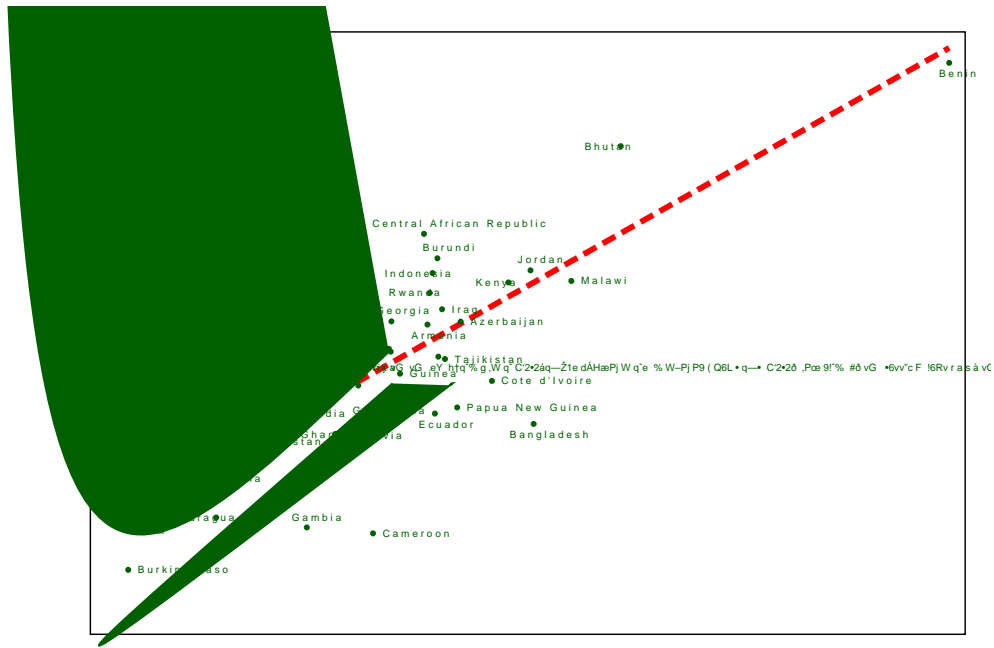
Notes: Panel a): plot of the total female bias of trade policy against the cost-of-living bias of trade policy. The total female

exacerbates inequality in the incomes of female- relative to male-headed households by 0.6 percentage points on average. Tari protection accounts for about a fourth of the gender income inequality across countries.

The reason can be found in the seminal work of Angus Deaton: female-headed households derive a smaller share of their income and spend a larger share of their budget on agricultural products than male-headed households. Tari protection in low-income and developing countries is characterized by relatively high duties on food and agriculture. Female headed households not only benefit less from the protection of agricultural incomes but are also disproportionately impacted by higher food prices as consumers. Female-headed households consequently bear the brunt of protectionism.

Figure 5 neatly summarizes these findings. It plots the female bias in trade protection index against the female net exposure to agricultural protection, which is the difference between the net agricultural sales income share (i.e. the income share minus the expenditure share,  $(s_{ag}^f - i_{ag}^f)$   $(s_{ag}^m - i_{ag}^m)$ ), for female-headed households vis a vis male-headed ones. The correlation between net agricultural sales exposure and the female bias is strongly positive: in those countries where female-headed households are net producers in agriculture relative to male headed ones and thus benefit more from protectionism, tariffs have a pro-female bias. By contrast, in those countries in which female-headed households are net consumers relative to male-headed ones|the majority of the countries in our sample|the female bias turns negative.

Figure 5  
The Gender Bias and Women as Net-Consumers of Agriculture



Notes: plot of the total female bias of trade policy against the net relative exposure of females to agricultural protection. The total female bias measures how much more female-headed households gain from tariffs than male-headed ones, expressed in percentage of household-status quo expenditure. Relative exposure to agricultural protection is the difference in the income share, net of the expenditure share, for female- relative to male-headed households (i.e., a measure of the net-producer or net-consumer status of the household).



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Table 1  
Countries with Anti-Female Bias From Protectionism

Country	Welfare Effects			Income Effects			Expenditure Effects		
	Males	Females	Bias	Males	Females	Bias	Males	Females	Bias
Burkina Faso	-0.50 (0.06)	-3.05 (0.15)	-2.55 (0.16)	-6.07 (0.03)	-6.57 (0.08)	-3.53 (0.09)	5.58 (0.05)	3.52 (0.11)	-2.05 (0.12)
Cameroon	-6.31 (0.08)	-8.52 (0.12)	-2.21 (0.14)	-12.27 (0.04)	-13.11 (0.06)	-10.07 (0.08)	5.96 (0.07)	4.59 (0.10)	-1.37 (0.12)
Mali	0.48 (0.05)	-1.70 (0.26)	-2.18 (0.27)	-2.47 (0.05)	-4.97 (0.24)	-0.29 (0.24)	2.95 (0.03)	3.27 (0.16)	0.32 (0.17)
Gambia	-1.46 (0.14)	-3.61 (0.26)	-2.15 (0.29)	-7.77 (0.09)	-8.76 (0.19)	-5.62 (0.21)	6.31 (0.11)	5.15 (0.19)	-1.16 (0.22)
Nicaragua	-1.20 (0.08)	-3.26 (0.07)	-2.06 (0.11)	-5.89 (0.04)	-6.41 (0.05)	-3.83 (0.07)	4.69 (0.07)	3.16 (0.06)	-1.54 (0.09)
Ethiopia	-1.75 (0.06)	-3.45 (0.07)	-1.69 (0.09)	-7.20 (0.03)	-7.57 (0.04)	-5.50 (0.06)	5.45 (0.04)	4.12 (0.05)	-1.33 (0.07)
Uzbekistan	-3.13 (0.04)	-4.65 (0.08)	-1.52 (0.09)	-6.65 (0.04)	-7.83 (0.07)	-5.13 (0.08)	3.52 (0.03)	3.18 (0.05)	-0.34 (0.06)
Niger	-1.80 (0.06)	-3.30 (0.18)	-1.50 (0.19)	-6.24 (0.03)	-6.86 (0.10)	-4.74 (0.10)	4.44 (0.05)	3.56 (0.14)	-0.88 (0.15)
Ghana	2.24 (0.07)	0.96 (0.10)	-1.28 (0.12)	-3.92 (0.03)	-3.84 (0.05)	-2.64 (0.06)	6.16 (0.06)	4.80 (0.09)	-1.36 (0.11)
Pakistan	-2.28 (0.04)	-3.54 (0.10)	-1.26 (0.11)	-5.64 (0.02)	-5.95 (0.06)	-4.39 (0.06)	3.36 (0.03)	2.42 (0.08)	-0.95 (0.08)
Vietnam	-0.76 (0.06)	-2.00 (0.10)	-1.25 (0.11)	-7.14 (0.03)	-6.86 (0.05)	-5.89 (0.06)	6.39 (0.05)	4.86 (0.08)	-1.53 (0.10)
Bolivia	-2.53 (0.09)	-3.72 (0.11)	-1.20 (0.14)	-6.54 (0.04)	-6.55 (0.07)	-5.35 (0.08)	4.02 (0.08)	2.83 (0.10)	-1.19 (0.12)
Bangladesh	-0.29 (0.06)	-1.48 (0.15)	-1.19 (0.16)	-7.13 (0.02)	-7.39 (0.05)	-5.94 (0.06)	6.84 (0.06)	5.91 (0.13)	-0.92 (0.15)
Ecuador	-2.70 (0.04)	-3.79 (0.05)	-1.09 (0.06)	-7.25 (0.02)	-7.60 (0.04)	-6.15 (0.04)	4.54 (0.03)	3.80 (0.05)	-0.74 (0.06)
Madagascar	1.26 (0.05)	0.18 (0.09)	-1.08 (0.10)	-3.88 (0.02)	-4.17 (0.04)	-2.80 (0.05)	5.15 (0.04)	4.35 (0.07)	-0.80 (0.08)
Guatemala	-1.61 (0.03)	-2.67 (0.05)	-1.06 (0.06)	-4.77 (0.02)	-4.92 (0.03)	-3.71 (0.04)	3.16 (0.03)	2.26 (0.04)	-0.91 (0.05)
Papua New Guinea	-1.60 (0.05)	-2.63 (0.17)	-1.03 (0.18)	-4.64 (0.05)	-5.39 (0.18)	-3.61 (0.19)	3.05 (0.05)	2.77 (0.12)	-0.28 (0.13)
Cambodia	3.26 (0.12)	2.27 (0.22)	-0.99 (0.25)	-5.28 (0.04)	-5.68 (0.08)	-4.29 (0.09)	8.54 (0.10)	7.94 (0.20)	-0.60 (0.22)
Yemen	-2.59 (0.03)	-3.54 (0.09)	-0.95 (0.10)	-5.39 (0.02)	-5.79 (0.07)	-4.43 (0.07)	2.80 (0.02)	2.25 (0.06)	-0.55 (0.07)
Mongolia	0.11 (0.03)	-0.75 (0.05)	-0.85 (0.05)	-3.27 (0.02)	-3.71 (0.03)	-2.41 (0.04)	3.38 (0.02)	2.96 (0.03)	-0.42 (0.03)
Liberia	-1.35 (0.06)	-2.18 (0.08)	-0.83 (0.10)	-4.44 (0.03)	-4.87 (0.04)	-3.61 (0.05)	3.08 (0.05)	2.69 (0.07)	-0.39 (0.09)

Notes: Authors' calculations. The table presents the welfare effects of tariff protection, the gender bias and the nominal income and cost-of-living sources of gains and gender biases. Standard errors are reported in parenthesis. All numbers are expressed in percent of household status-quo expenditure.



Table 2  
Countries with Pro-Female Bias From Protectionism

Country	Welfare Effects			Income Effects			Expenditure Effects		
	Males	Females	Bias	Males	Females	Bias	Males	Females	Bias
Rwanda	0.14 (0.10)	0.17 (0.15)	0.04 (0.18)	-5.11 (0.06)	-4.92 (0.09)	-5.15 (0.10)	5.25 (0.07)	5.09 (0.11)	-0.16 (0.13)
Ukraine	-3.27 (0.03)	-3.20 (0.01)	0.07 (0.04)	-4.66 (0.02)	-4.54 (0.01)	-4.73 (0.02)	1.39 (0.02)	1.34 (0.01)	-0.05 (0.02)
Kenya	-2.93 (0.06)	-2.80 (0.17)	0.13 (0.18)	-8.63 (0.04)	-8.09 (0.12)	-8.76 (0.13)	5.70 (0.05)	5.29 (0.15)	-0.41 (0.16)
Malawi	-2.40 (0.05)	-2.26 (0.08)	0.15 (0.10)	-7.06 (0.03)	-6.22 (0.06)	-7.20 (0.06)	4.66 (0.04)	3.96 (0.06)	-0.69 (0.07)
Comoros	0.22 (0.06)	0.37 (0.11)	0.15 (0.12)	-2.98 (0.04)	-2.86 (0.06)	-3.13 (0.07)	3.20 (0.04)	3.24 (0.09)	0.04 (0.10)
Indonesia	-1.90 (0.02)	-1.69 (0.04)	0.22 (0.05)	-3.32 (0.02)	-2.82 (0.04)	-3.54 (0.04)	1.41 (0.01)	1.14 (0.03)	-0.27 (0.03)
Jordan	-4.09 (0.04)	-3.84 (0.10)	0.24 (0.11)	-8.31 (0.04)	-8.15 (0.09)	-8.56 (0.10)	4.22 (0.02)	4.31 (0.05)	0.09 (0.05)