

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, are more reliant on remittances, and spend a larger share of their budgets on food than male-headed ones.

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Protectionism and Gender Inequality in Developing Countries*

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1 Introduction

After decades of progressive globalization, spurred in part by trade tariff liberalization, protectionism is on the rise. Own tariff protection boosts nominal incomes by raising firm 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.

The paper is organized as follows. In Section 2, we discuss the methods used in the analysis, and, in Section 3 we describe the data. Section 4 presents the results and Section 5 ends with a summary and conclusions.

2 Method

Our framework is based on the two-step approach of the trade and poverty literature. In the first step, the imposition of import tariffs leads to changes in domestic prices. Subsequently,

those changes in prices and wages affect households as consumers, producers and wage earners. The impact would depend on the degree of households' dependence on various goods and factors of production, and the economic sectors in which they are employed. In our study, we are interested in assessing if the effect of trade protection is different for male and female-headed households.

We follow Artuc, Porto and Rijkers (2019), who use an extended agricultural household model to define household welfare (Singh, Squire and Strauss, 1986; Benjamin and Deaton, 1993), and we derive the welfare effects using first order approximations (Deaton, 1989; Porto, 2006; Nicita, Olarreaga and Porto, 2014). In these models, household well-being is measured with the indirect utility function, which depends on prices and expenditures. Assuming that households spend all their income on consumption goods (both traded and non-traded), we can directly focus on the impacts of trade policies on the level of household real income. As in the literature, then, trade policy affects prices and prices affect households as consumers and as income earners.

The real income x^h of household h is given by the ratio of nominal income y^h and a household-specific index price P^h :

$$(1) \quad x^h = \frac{y^h}{P^h}.$$

We define a Cobb-Douglas price index:

$$(2) \quad P^h = \prod_i p_i^{(s_i^h)},$$

where p_i is the price of good i and s_i^h is the expenditure share of good i by household h (Friedman and Levinshon, 2002).

Trade policy changes, and thus price changes, affect households as income earners (the numerator in 1). We use an extended definition of household income. Different authors have focused on different components of household income and two main approaches have been developed. Deaton (1989) and Benjamin and Deaton (1993), for instance, work with income earned from sales of agricultural production. Porto (2006) introduces wage income in a study

of Argentina. Nicita (2009) and Ural Marchand (2012) adopt a similar strategy for the cases of Mexico and India. Nicita, Olarreaga and Porto (2014) investigate both sources of income, sales of agricultural products and wages. Here, on top of labor and agricultural sales income, we also explore impacts on income earned in household enterprises or small businesses. This is a priori important because the development literature has recently emphasized the role of home businesses in the economy of poor households (Banerjee and Duflo, 2011).

Concretely, it is useful to think about household income as being determined in a farm-household model, as in Sign, Squire and Strauss (1986). In these models, household income is given by:

$$(3) \quad y_h = y_w^h(p) + \sum_j \pi_j^h(p) + T^h,$$

where y_w^h is labor wage income and π_j^h are profits obtained from various household production activities j , and T^h are transfers (e.g., public transfers or taxes). Labor income includes wages earned in potentially different activities in both traded and non-traded sectors. This could capture wage earnings in traded manufacturing sectors or in services, retail trade or in the government. In π_j^h , we include both net income from the sales of agricultural products and profits from household enterprises. This distinction is useful. In the case of trade policy affecting primary products such as maize, agricultural income captures income from the sales of maize grains, while enterprise income may capture instead income from sales of ground maize. In other cases, such as trade policy affecting processed goods, there will only be income from family enterprises.

Both labor income and enterprise income consequently depend on a vector of product prices \mathbf{p} . To explore how, we begin with labor markets and labor income. To simplify, we assume that households supply one unit of labor inelastically and that labor is homogeneous. There are many sectors in the economy, and we assume that the household supplies all its labor to one of these sectors. Furthermore, we assume a specific factor, Ricardo-Viner model with sector-specific labor. This is a simple yet convenient representation of the short-run impacts in labor markets because, with specific labor, the wage in one sector is affected

one-to-one by the price change. It follows that

$$(4) \quad \frac{\partial y_w^h}{\partial p_i} = \frac{\partial w_i}{\partial p_i} = 1.$$

Many households own land and use it to produce agricultural products, either food crops such as maize, wheat, or rice, or cash crops, such as cotton, tobacco, cocoa, and so on. Cash crops are directly sold in the market. Instead, food crops are often partly consumed by the household (this is auto- or own-consumption) while the surplus is also sold in the market. These are sources of agricultural production income, which we include in π_j^h . The household may also own a (small) business. Some households do some basic processing to the agricultural product and sell the processed food. Others may own tools and perform odd-jobs or may operate (small) shops in various non-traded sectors. In these cases, profits in non-traded sectors are assumed not to be affected by the tariffs.

If a household earns profits in a traded sector i , e.g. cotton, then the first order effect of a change in price p_i on income is the quantity produced q_i^h (e.g., kilograms of cotton). This is the Hotelling Lemma:

$$(5) \quad \frac{\partial \pi_i}{\partial p_i} = q_i^h.$$

To wrap up, equation (4) describes how wage income responds to prices, while equation (5) does so for profit income.

We now turn to the impacts of trade policy on households as consumers (the denominator in (1)). To do this, we need to derive how the household-specific index price (2) changes in response to a price change p_i . We have that

$$(6) \quad \frac{\partial P^h}{\partial p_i} = s_i^h \frac{P^h}{p_i}.$$

Combining (4), (5) and (6), the proportional change in the real income of household h is

given by:

$$(7) \quad \frac{\partial \ln x^h}{\partial \ln p_i} = \phi_w^h + \phi_i^h - s_i^h,$$

where, again, s_i^h is the share of good i in the consumption bundle of household h , ϕ_w^h is the share of labor income in total income, and ϕ_i^h is the share of income from sales or from home businesses in traded sector i . The interpretation of this equation is straightforward. Following an exogenous price change $d \ln p_i$ and given the endogenous responses of wages, the first order effects on real income can be well-approximated with the corresponding expenditure and income shares. This is an extended version of the net-consumer, net-producer proposition (Deaton, 1989). A price increase hurts net-consumers and benefits net-producers, with the net position of a household defined in an extended model including not only consumption and production of traded goods, but also labor income and enterprise income.

As in Nicita, Olarreaga and Porto (2014), we want to have a measure of the welfare effects generated by the entire structure of protection and for different trade policy instruments. To do this, we sum the changes in welfare in (7) over all traded goods i to obtain a formula for the proportional change in real income:

$$(8) \quad d \ln x^h = \sum_i (\phi_w^h + \phi_i^h - s_i^h) d \ln p_i.$$

As a final step to operationalize the formulas, we need an expression for the price change $d \ln p_i$. A convenient assumption is to work with a full pass-through model because then we can translate our measures of trade protection directly into domestic price changes. Inasmuch as the pass-through rate is homogeneous across households and, in particular, homogeneous across males and females, this assumption will not affect our conclusions at all. If the free trade price of the good is p_i^* (the world price), a tariff τ_i raises it to $p_i = p_i^*(1 + \tau_i)$. Consequently, we can think of protection as increasing prices by

$$(9) \quad d \ln p_i = \tau_i.$$

In the end, the estimable welfare effects of protection are given by

$$(10) \quad d \ln x^h = \sum_i (\phi_w^h + \phi_i^h - s_i^h) \tau_i.$$

We now introduce an index of the anti-female bias in the structure of trade protection. We define trade policy as being anti-female if the existing structure of protection harms female-headed households more than male-headed households. If the existing structure of protection is anti-female, that would imply that the elimination of this protection structure would be pro-female, in the sense that the proportional change in welfare following trade liberalization would be larger for female-headed households than for male-headed households. Accordingly, we propose an indicator of anti-female bias in the structure of trade protection given by the difference between the percentage change in welfare due to trade protection of the average female-headed household vis-à-vis the average male-headed household:

$$(11) \quad F = E[d \ln x^h | H^h = f] - E[d \ln x^h | H^h = m],$$

where H^h is an indicator variable equal to m for male-headed households and equal to f for female-headed households. A negative indicator ($F < 0$) implies that the current trade protection harms female-headed households more than male-headed households. In this situation, trade liberalization would be biased in favor of female-headed households because the percentage change in income for female-headed households would be larger than for male-headed households.

It is very important to understand the scope and limitations of our measure of gender bias F . The index is a conditional mean and, as such, it should be interpreted as a differential welfare effect for female-headed households relative to male-headed households. This captures gender inequality issues related to decisions mostly made by household heads, but not necessarily to other features of gender differences. For instance, the index captures the role of some consumption decisions (such as for instance food and education expenditures) and of some income-generating decisions or limitations (such as crop growing choices or barriers to labor employment). We explore some of these mechanisms below. Of course,

our measure of gender bias does not necessarily apply to females in general and it would be wrong to extrapolate our conclusions to the female population. But we believe that nevertheless, our results provides very useful insights into gender inequality considerations and trade protection.

3 Data

The estimation of the welfare impact of trade policy requires a combination of household survey and trade policy data. The household surveys provide information on consumption and production of traded goods, and labor and enterprise income. These data are needed to calculate the income and the expenditure shares. The trade policy data provide the information on tariffs needed to calculate the price changes.

To quantify the anti-female bias of trade policy, we use harmonized data on incomes and expenditures from 54 representative household surveys (Artuc, Porto and Rijkers, 2019). The data comprises 521,639 households which are representative of approximately 1.8 billion people in developing countries. On the expenditure side, we cover 53 agricultural and food items, such as corn, wheat, rice, oils, cotton and tobacco; 5 manufacturing items; 5 non-tradeable services; and 4 other expenditure categories. On the income side, we keep track of income derived 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.

Table 1 presents the household surveys for the 54 developing countries considered in the analysis. The table reports the name of the survey, the year when the data was collected, and the number of households in each survey. The analysis includes 28 Sub-Saharan African (SSA) countries, 4 countries in the Middle East and North Africa (MENA) region, 8 countries in Europe and Central Asia, 5 countries in South Asia, 5 countries in East Asia and Pacific,

and 4 countries in the Latin American and Caribbean region.

We use information on the gender of the household head to classify households as male-headed and female-headed households. Table 2 provides summary statistics for each household survey. We report the average log per capita expenditure and average household size for the whole survey and by gender of the head of the household. It is interesting to note that the average level of livelihood for male-headed household is not systematically higher than for female-headed households. In addition, outside the Sub-Saharan Africa (SSA) region, male-headed household are on average larger than female-headed households in all countries. In SSA, male-headed households are larger in 22 of the 28 countries.

The import tariff data is summarized in Table 3 and in Figure 1. For our analysis we have grouped the import tariff data in three categories of goods: staple agricultural products, non-staple agricultural products and manufactured imported products. Table 3 reveals a large dispersion in the average import tariffs. For instance in Sub-Saharan Africa, for staple agricultural products the average tariff applied in Burundi is 23.8 percent but only 1.8 percent in the Comoros. The same applies for non-staple agricultural products where Rwanda applies the highest average import tariff at 30.1 percent while Liberia's average tariff for this category is 5.6 percent. In manufacturing, tariffs in Sub-Saharan African countries vary from 6.8 percent (Zambia) up to 23 percent (Cameroon). Tariff dispersion across countries and within regions is also observed in other developing regions. For instance, in South Asia, import tariffs are very high for agricultural products in Bhutan (43.7 percent) and very low in Pakistan (3.7 percent), while there is far less dispersion of tariffs for manufactured products (ranging from 15.3 to 23.5 percent). In Latin America, Ecuador applies lower average tariff across all good categories than the other three countries in the region. In our sample, there are countries like Georgia, Indonesia, Ukraine and Iraq that apply average import tariffs that are 5 percent or lower, and countries like the Central Africa Republic, Rwanda and Bhutan where they are 20 percent or higher. Since we are assuming perfect pass-through from tariff cuts to domestic prices, Table 3 not only displays the average tariff but also the corresponding price change caused by protection. Given this, we would expect to observe the largest welfare changes in highly protected countries like Cameroon, Rwanda or Bhutan

but the overall impact will depend on the combination of consumption and income effects that sometimes cancel out. We will discuss this in detail in section 4 below. However, before doing that, we need to consider the incidence of the three categories of goods in the expenditure and income of the households in our sample.

How much households are affected as consumers depends on the level of exposure to the price change each household faces. This is captured by the expenditure shares s_i^h . Table 4 reports the share of expenditures that male-headed and female-headed households spend on tradable goods (staple agriculture, non-staple agriculture, and manufacture), non-tradeable goods, other goods and home consumption. Not surprisingly, in most countries, the share households spend on agricultural goods (food) tend to be very large. Of the 54 countries in our sample, households in 50 countries dedicate on average more than one quarter of their resources for staple agricultural products. This implies that tariffs in food products may have negative welfare impact, particularly for urban households that tend to be net food consumers. Manufactured goods are on average the second largest expenditure component in developing countries but there is a lot of variability across countries. They account for more than a quarter of total expenditures in Ghana, Malawi, South Africa, Iraq, Kyrgyz Republic, Moldova, and Bhutan but less than 10 percent in Guinea Bissau, Mali, Zambia, Armenia, Uzbekistan, Sri Lanka, and Papua New Guinea. Home consumption also accounts for an important part of total expenditures in some countries. In eleven countries in our sample, it accounts for more than one-quarter of total expenditures but in seven countries home consumption is on average less than 5 percent of total expenditures.

Table 4 also presents the difference in consumption patterns depending on the gender of the head of the households. A close observation of the data shows that in 47 of the 54 countries, female headed households spend on average a larger share of their budget on staple agricultural products than male-headed households do. Except for Bhutan, all the other exceptions are in Sub-Saharan Africa: Benin, Kenya, Malawi, Mozambique, Uganda and Zambia. When considering all tradable goods together, female-headed households are slightly more exposed as consumers to international trade than male-headed households (share of tradable goods in expenditure of 64.6 percent versus 62.2 percent).

Table 5 displays the income shares for male and female-headed households in our sample of developing countries. These shares capture household exposure to trade for households as income earners (ϕ_i^h and ϕ_w^h in the notation of the model). Our methodology allows us to identify six sources of income: the sales of staple agricultural goods, the sales of non-staple agricultural goods, wages, income from family enterprises, other income, and production of goods for home consumption. In our sample, wages are the largest source of income on average. However, there are significant differences between the share of income coming from wages among male-headed households (31 percent) and female-headed households (23 percent). In fact, in all countries but Benin, Guinea, Mali, Niger, Cambodia, Vietnam and Nicaragua, the share of income coming from wages is larger for male than for female-headed households. The second largest source of income in our sample is other income. This category is the largest source of income for female-headed households (29.3 percent) and includes transfers and remittances. Home consumption is on average the third largest source of income in our sample. However, once again, there is a lot of heterogeneity across countries. It accounts for more than 40 percent in six countries in our sample but less than 5 percent in seven countries. When looking at the gender of the head of the household, there is not a significant difference between the share of income from home consumption among male (22.4 percent) and female-headed households (21.8 percent).

4 The Anti-Female Bias of Tariff Protection

4.1 The Anti-Female Bias

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 of the 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. As explained above, throughout our discussion, we refer to a female-head bias of trade policy only (rather than a more general female bias).

The gender bias is presented in Table 6 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 the 1 percent level, except for Azerbaijan which is significant at the 5 percent level.

In the remaining 12 countries, there is a pro-female bias instead. These are shown in Table 7. 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 of this 2.6 percent difference. This means that, worldwide across poor and lower-middle-income countries, protectionism accounts for about a fourth of the status-quo gender income inequality.

4.2 Mechanisms

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.”

4.2.1 The female nominal income bias

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 income female biases are reported in Tables 6 and 7, columns 3-6. The nominal income bias is very strong: in 47 of the 54 countries, the nominal income bias is anti-female. Moreover, countries with larger income female biases are countries with larger overall biases. As can be seen in panel a) of Figure 3, the correlation between the nominal income female bias and the overall female bias is extremely strong, 0.76, and the slope of the linear fit is 1.04, very close to (and statistically undistinguishable from) 1. The anti-female income bias of protection is a major source of gender inequality.

The major underlying driver of the female nominal income bias is that female headed households participate proportionately less in agriculture than male-headed ones and, consequently, benefit relatively less from the protection of agricultural incomes offered by agricultural tariffs. To illustrate this mechanism, we compute the difference in the share of income derived from agricultural sales between female- and male-headed households, $\phi_{ag}^f - \phi_{ag}^m$ in terms of the notation of our theoretical framework. This difference captures how much more exposed to tariff protection females are relative to males. A positive (negative) difference implies women would benefit more (less) from protection as producers. In panel b) of Figure 3, we present the strong correlation between the nominal income female bias and the differential share of income derived from agricultural sales, that is, the relative exposure to agricultural income. Countries where female headed households derive a smaller share of their income from agricultural sales than male-headed ones (i.e., where relative agricultural exposure $\phi_{ag}^f - \phi_{ag}^m$ is negative) tend to have larger anti-female income biases. By the same token, countries where relative female agricultural sales exposure is positive ($\phi_{ag}^f - \phi_{ag}^m > 0$) tend to be countries with a pro-female income bias. Across countries, on average, female-headed households enjoy lower income gains than male-headed ones.

There are several theories that can explain why females participate less in market agriculture than males. A review can be found in the World Development Report (2012). In many less developed countries, social norms that affect marriage and fertility decisions,

and that determine the role of women outside her household, often lead to lower female labor force participation (Duflo, 2012; Jayachandran, 2015). In the case of agriculture, the nature of the production process in these economies often requires physical strength, endowing men with a comparative advantage in agricultural work (Jayachandran, 2015). As pointed out by Alessina, Giuliano and Nunn (2013), 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 (Porto, Depetris Chauvin and M. Olarreaga, 2011).

Another (complementary) explanation is that female-headed households are more reliant on remittances and transfers. Indeed, Appleton (1996) shows that higher remittances receipts in female-headed households have been instrumental in preventing increases in gender inequality in Uganda, while Amuedo-Dorantes and Pozo (2006) show that remittances adversely affected female but not male labor force participation in Mexico (see also De la Briere, Sadoulet, De Janvry, and Lambert 2002). 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, $\phi_r^f - \phi_r^m$). 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.

4.2.2 The female cost-of-living bias

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 6 and 7). 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 countries with large anti-female bias overall. However, the cost-of-living bias is weaker than the female nominal income bias. In fact, the cost-of-living bias is negative (that is, there is an anti-female bias) in 33 of the 54 countries, while the anti-female nominal income bias is negative in 47 countries.

The major underlying driver of this result is that female headed households spend a larger share of their budget on food products than male-headed ones. This can be seen in panel b) of Figure 4, which shows the strong negative correlation between the cost-of-living female bias and the relative female exposure to agricultural spending (the difference in the budget share spent on agricultural goods between female- and male-headed households, $s_{ag}^f - s_{ag}^m$). When female headed households spend a larger share of their budget on food items than male ones, so that $s_{ag}^f - s_{ag}^m > 0$, the cost-of-living bias turns negative and large.

Several interrelated theories can rationalize the anti-female cost-of-living bias. The fact that female-headed households are less reliant on agriculture implies that, *ceteris paribus* (i.e., at a given level of food requirement), they need to rely more on purchases of agricultural products on the market. Moreover, evidence from economics (Angelucci and Attanasio, 2013; Braido, Olinto and Perrone, 2012; Hodinott and Haddad, 1995; Doss 2006), medicine (Johnson and Large Rogers, 1993) and behavioral science (Christov-Moore, Simpson, Coudé, Grigaityte, Iacoboni, and Ferrari, 2014) shows that women are more altruistic and care more about child nutrition than males, which raises food budget shares. When tariffs increase food prices, female-headed households are disproportionately hurt.

5 Conclusion

Countries use tariffs to raise government revenue and protect the incomes of producers and workers. Yet, evidence from 54 low and middle income countries shows that tariff protection creates an (inadvertent) anti-female welfare bias that exacerbates gender inequality. In the absence of trade protection, across the countries in our sample the real incomes of female headed households would be 2.4 percentage points higher, while those of male headed households would be 1.8 percentage points higher. The prevailing pattern of tariffs thus exacerbates inequality in the incomes of female- relative to male-headed households by 0.6 percentage points on average. Tariff 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 from and spend a larger share of their budget on agricultural products than male-headed households. Tariff 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, $(\phi_{ag}^f - s_{ag}^f) - (\phi_{ag}^m - s_{ag}^m)$), 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.

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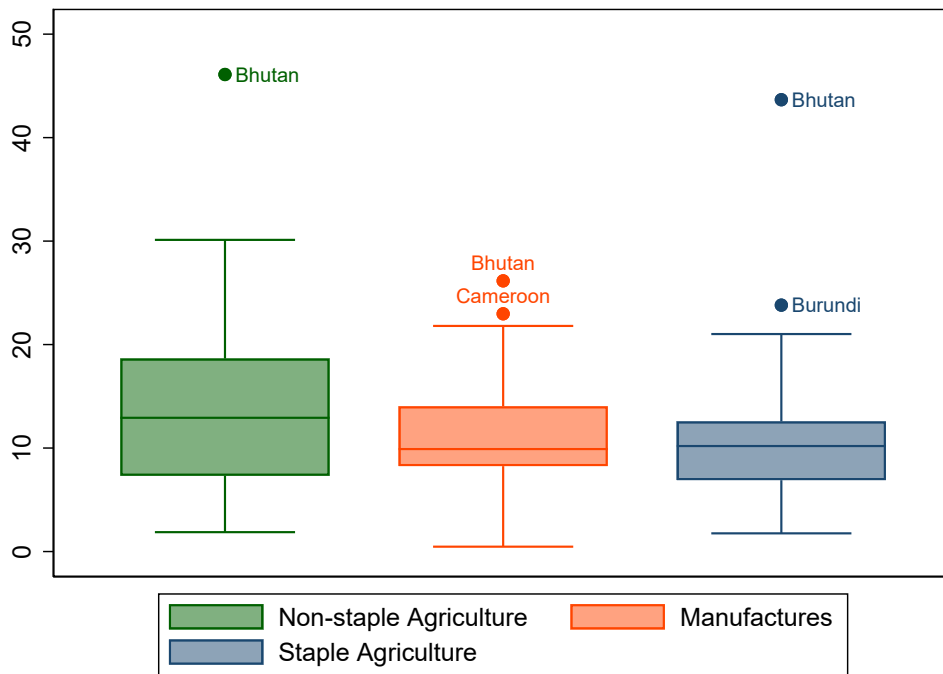
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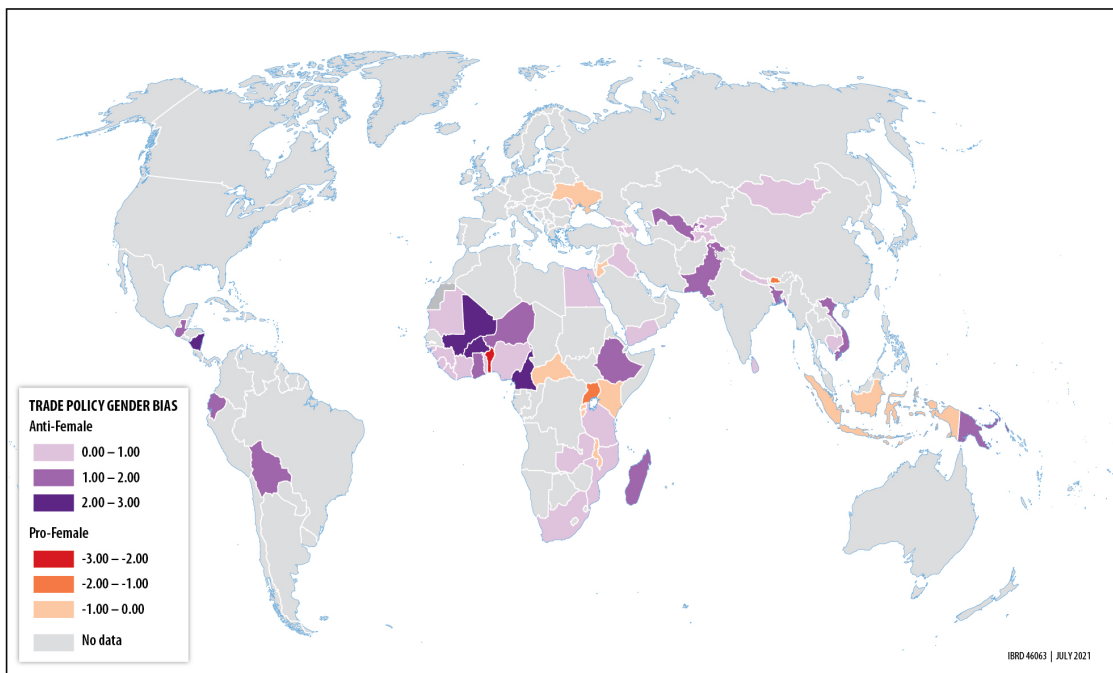
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Figure 1
 Tariff Protection Across the Developing World



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.

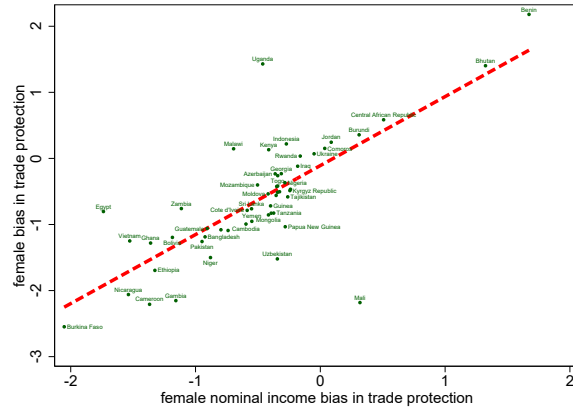
Figure 2
The Gender Bias of Tariff Protection Across the Developing World



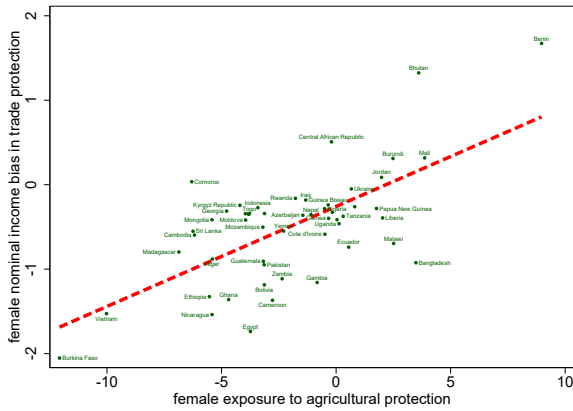
Notes: World map of the male bias of tariff, which measures how much more male-headed households gain from tariffs than female-headed ones, expressed in percentage of household-status quo expenditure. Countries with anti-female trade protection are plotted in violet, with more intense shades of violet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

Figure 3
The Gender Bias and the Nominal Income Gender Bias

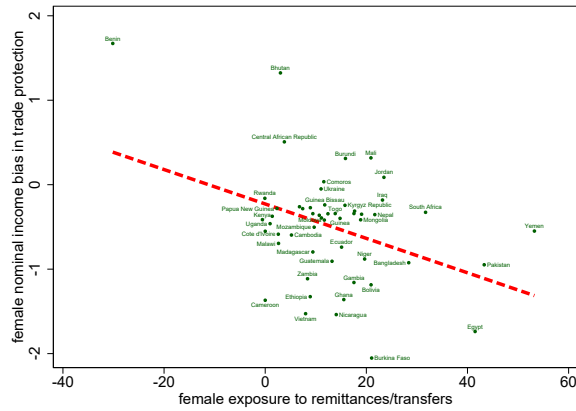
(a) the nominal income female bias



(b) market agricultural income



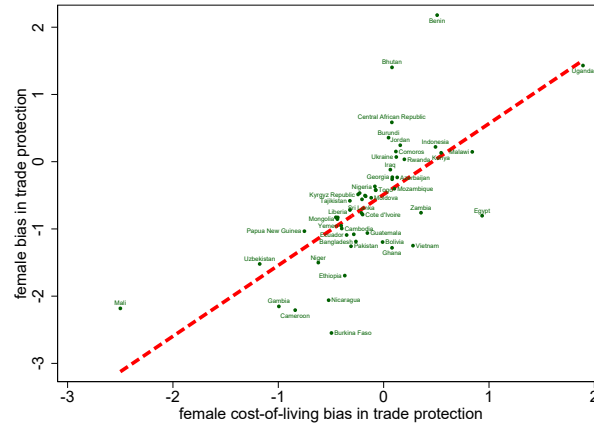
(c) remittances and transfers



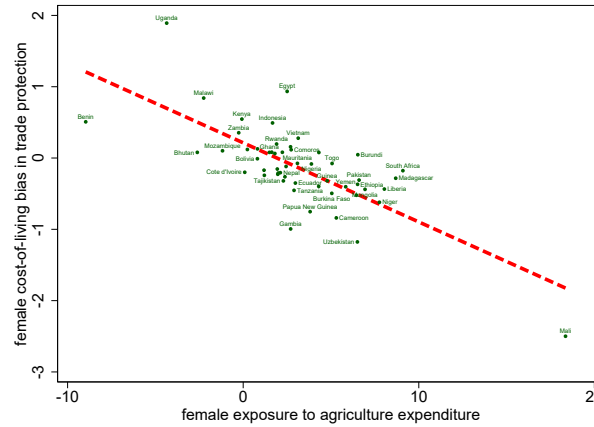
Notes: Panel a): plot of the *total* female bias of trade policy against the *nominal income* bias of trade policy. The total female bias measures how much more female-headed households gain from tariffs than male-headed ones, expressed in percentage of household-status quo expenditure. The female nominal 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).

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

(a) the cost-of-living female bias

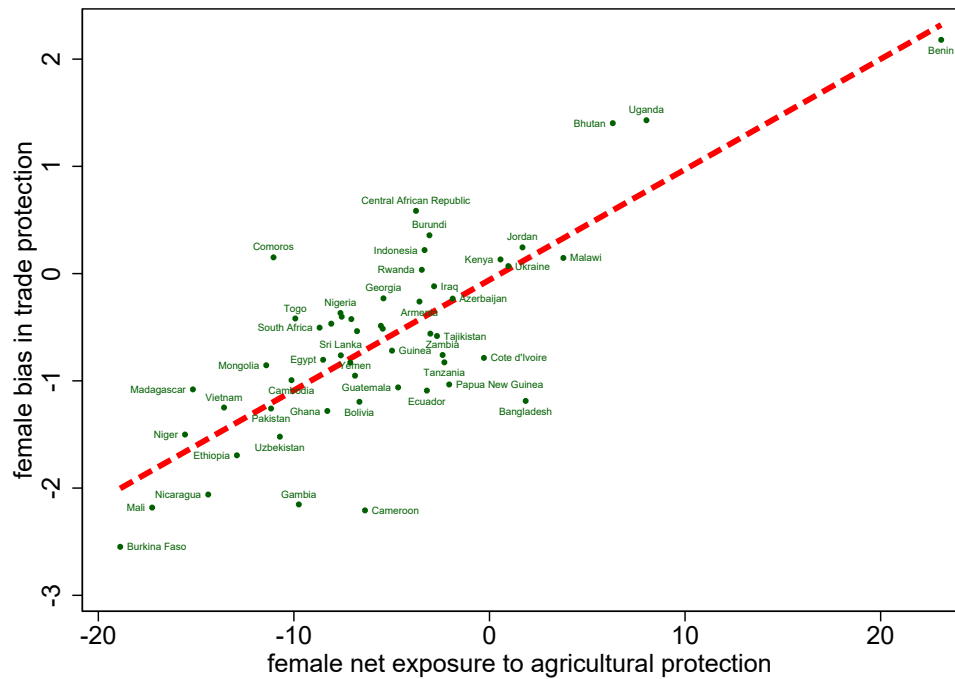


(b) agriculture expenditures



Notes: Panel a): plot of the *total* female bias of trade policy against the *cost-of-living* bias of trade policy. The total female bias measures how much more female-headed households gain from tariffs than male-headed ones, expressed in percentage of household-status quo expenditure. The cost-of-living bias is the difference between the effects of tariffs only on the cost of living index for female- and male-headed households. Panel b) plots the cost-of-living bias against the relative exposure of females to food expenditures (the difference in the share of agriculture and food expenditures for female- relative to male-headed households).

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).

Table 1
Household Surveys

Country	Year	Obs	Survey
Benin	2003	5296	Questionnaire Unifié sur les Indicateurs de Base du Bien-Être
Burkina Faso	2003	8413	Enquête sur les Conditions de Vie des Ménages
Burundi	1998	6585	Enquête Prioritaire sur les Conditions de Vie des Populations
Cameroon	2001-2002	10881	Deuxième Enquête Camerounaise Auprès des Ménages
Central Af. Rep.	2008	6828	Enquête Centrafricaine pour le Suivi-Evaluation du Bien-être
Comoros	2004	2929	Enquête Intégrale auprès des Ménages
Côte d'Ivoire	2008	12471	Enquête sur le Niveau de Vie des Ménages
Egypt	2008-2009	23193	Household Income, Expenditure and Consumption Survey
Ethiopia	1999-2000	16505	Household Income, Consumption and Expenditure Survey
The Gambia	1998	1952	Household Poverty Survey
Ghana	2005-2006	8599	Living Standards Survey V
Guinea	2012	7423	Enquête Légère pour l'Evaluation de la Pauvreté
Guinea Bissau	2010	3141	Inquerito Ligeiro para a Avalicão da Pobreza
Kenya	2005	13026	Integrated Household Budget Survey
Liberia	2014-2015	4063	Household Income and Expenditure Survey
Madagascar	2005	11661	Permanent Survey of Households
Malawi	2004-2005	11167	Second Integrated Household Survey
Mali	2006	4449	Enquête Légère Intégrée auprès des Ménages
Mauritania	2004	9272	Enquête Permanente sur les Conditions de Vie des Ménages
Mozambique	2008-2009	10696	Inquérito sobre Orçamento Familiar
Niger	2005	6621	Enquête Nationale sur les Conditions de Vie des Ménages
Nigeria	2003-2004	18603	Living Standards Survey
Rwanda	1998	6355	Integrated Household Living Conditions Survey
Sierra Leone	2011	6692	Integrated Household Survey
South Africa	2000	25491	General Household Survey
Tanzania	2008	3232	Household Budget Survey
Togo	2011	5464	Questionnaire des Indicateurs de Base du Bien-être
Uganda	2005-2006	7350	National Household Survey
Zambia	2004	7563	Living Conditions Monitoring Survey IV

Notes: List of household surveys, name, year of data collection and sample size.

Table 1 (cont.)
Household Surveys

Country	Year	Obs	Survey
Armenia	2014	5124	Integrated Living Conditions Survey
Bangladesh	2010	12117	Household Income and Expenditure Survey
Bhutan	2012	8879	Living Standards Survey
Cambodia	2013	3801	Socio-Economic Survey
Indonesia	2007	12876	Indonesian Family Life Survey
Iraq	2012	24895	Household Socio-Economic Survey
Jordan	2010	11110	Household Expenditure and Income Survey
Kryrgyz Republic	2012	4962	Intergrated Sample Household Budget and Labor Survey
Mongolia	2011	11089	Household Socio-Economic Survey
Nepal	2010-2011	5929	Living Standards Survey
Pakistan	2010-2011	16178	Social and Living Standards Measurement Survey
Papua New Guinea	2009	3776	Household Income and Expenditure Survey
Sri Lanka	2012-2013	20335	Household Income and Expenditure Survey
Tajikistan	2009	1488	Tajikistan Panel Survey
Uzbekistan	2003	9419	Household Budget Survey
Vietnam	2012	9306	Household Living Standard Survey
Yemen	2005-2006	12998	Household Budget Survey
Azerbaijan	2005	4797	Household Budget Survey
Georgia	2014	10959	Household Integrated Survey
Moldova	2014	4836	Household Budget Survey
Ukraine	2012	10394	Sampling Survey of the Conditions of Life of Ukraine's Households
Bolivia	2008	3900	Encuesta de Hogares
Ecuador	2013-2014	28680	Encuesta de Condiciones de Vida
Guatemala	2014	11420	Encuesta Nacional de Condiciones de Vida
Nicaragua	2009	6450	Encuesta Nacional de Hogares sobre Medición de Niveles de Vida

Notes: List of household surveys, name, year of data collection and sample size.

Table 2
Summary Statistics

Country	log p.c. expenditure			household size			gender of head	
	all	male	female	all	male	female	male	female
Benin	9.35	9.51	9.32	4.95	3.36	5.27	0.17	0.83
Burkina Faso	9.13	9.13	9.13	5.57	5.73	3.81	0.92	0.08
Burundi	7.49	7.61	7.16	4.97	5.22	4.25	0.74	0.26
Cameroon	10.18	10.17	10.20	4.94	5.30	3.81	0.76	0.24
Central African Republic	8.94	8.94	8.97	4.56	4.73	3.93	0.78	0.22
Comoros	9.88	9.85	10.01	5.77	6.06	4.70	0.79	0.21
Cote d'Ivoire	10.06	10.35	9.94	4.76	2.82	5.52	0.28	0.72
Egypt	5.72	5.69	5.87	4.68	4.95	3.38	0.83	0.17
Ethiopia	4.46	4.44	4.49	4.81	5.26	3.63	0.72	0.28
Gambia	5.14	5.08	5.49	7.78	8.06	6.30	0.84	0.16
Ghana	12.28	12.27	12.32	4.20	4.58	3.23	0.72	0.28
Guinea	5.69	5.69	5.74	6.45	6.65	5.11	0.87	0.13
Guinea Bissau	9.44	9.42	9.52	8.19	8.45	7.35	0.77	0.23
Kenya	7.67	7.67	7.67	5.09	5.08	5.19	0.90	0.10
Liberia	8.88	8.88	8.89	4.29	4.50	3.77	0.70	0.30
Madagascar	9.72	9.72	9.74	4.85	5.13	3.68	0.81	0.19
Malawi	7.21	7.25	7.07	4.52	4.74	3.77	0.77	0.23
Mali	10.36	10.38	10.15	8.53	8.77	5.97	0.92	0.08
Mauritania	9.57	9.55	9.66	5.66	5.95	4.41	0.81	0.19
Mozambique	6.87	6.88	6.84	4.68	5.02	3.85	0.71	0.29
Niger	9.15	9.14	9.31	6.37	6.55	4.05	0.93	0.07
Nigeria	7.37	7.34	7.54	4.91	5.23	3.22	0.84	0.16
Rwanda	8.44	8.53	8.23	4.96	5.29	4.26	0.68	0.32
Sierra Leone	11.81	11.80	11.84	5.60	5.66	5.45	0.73	0.27
South Africa	6.19	6.47	5.76	3.85	3.67	4.13	0.61	0.39
Tanzania	10.58	10.84	10.53	5.17	3.90	5.44	0.17	0.83
Togo	9.92	9.90	9.96	5.04	5.37	3.89	0.78	0.22

Notes: Authors' calculations based on household survey data. The table reports the average log of per capita expenditure and the average household size for the entire sample and for male- and female-headed households separately. The proportion of male- and female-headed households are reported in the last two columns.

Table 2 (cont.)
Summary Statistics

Country	log p.c. expenditure			household size			gender of head	
	all	male	female	all	male	female	male	female
Uganda	10.45	10.70	10.39	5.80	3.93	6.24	0.19	0.81
Zambia	11.20	11.19	11.23	5.62	5.92	4.65	0.77	0.23
Armenia	10.83	10.82	10.85	3.84	4.25	3.00	0.67	0.33
Bangladesh	0.75	0.74	0.78	4.50	4.68	3.39	0.86	0.14
Bhutan	8.33	8.31	8.39	4.53	4.57	4.43	0.71	0.29
Cambodia	5.71	5.71	5.71	4.47	4.66	3.72	0.79	0.21
Indonesia	6.23	6.21	6.29	3.98	4.24	2.87	0.81	0.19
Iraq	12.13	12.12	12.18	6.74	6.88	5.62	0.88	0.12
Jordan	4.80	4.77	5.00	5.39	5.65	3.68	0.87	0.13
Kyrgyz Republic	7.94	7.88	8.03	4.11	4.55	3.37	0.63	0.37
Mongolia	11.28	11.25	11.36	3.80	4.00	3.10	0.78	0.22
Nepal	8.56	8.53	8.62	4.85	5.22	3.82	0.73	0.27
Pakistan	8.35	8.37	8.15	6.39	6.54	4.96	0.91	0.09
Papua New Guinea	5.07	5.08	5.02	5.12	5.26	4.27	0.86	0.14
Sri Lanka	9.31	9.33	9.26	3.88	4.06	3.29	0.77	0.23
Tajikistan	5.54	5.53	5.61	6.68	6.92	5.52	0.83	0.17
Uzbekistan	9.93	9.89	10.06	5.11	5.41	4.11	0.77	0.23
Vietnam	7.30	7.27	7.40	3.85	4.05	3.26	0.74	0.26
Yemen	8.80	8.80	8.76	7.53	7.74	4.95	0.93	0.07
Azerbaijan	12.61	12.59	12.69	4.85	5.07	3.71	0.84	0.16
Georgia	-1.96	-1.96	-1.94	3.61	3.93	2.97	0.67	0.33
Moldova	7.51	7.51	7.50	2.57	2.82	2.20	0.59	0.41
Ukraine	7.09	7.06	7.09	2.58	3.10	2.45	0.20	0.80
Bolivia	6.62	6.60	6.68	3.86	4.09	3.18	0.75	0.25
Ecuador	5.38	5.38	5.37	3.66	3.84	3.14	0.74	0.26
Guatemala	6.85	6.82	6.98	4.77	5.00	3.93	0.78	0.22
Nicaragua	7.18	7.17	7.20	4.70	4.80	4.50	0.66	0.34

Notes: Authors' calculations based on household survey data. The table reports the average log of per capita expenditure and the average household size for the entire sample and for male- and female-headed households separately. The proportion of male- and female-headed households are reported in the last two columns.

Table 3
Average Tariffs

Country	Staple Agric.	Non-Staple Agric.	Manufactures	Country	Staple Agric.	Non-Staple Agric.	Manufactures
Benin	12.2	16.9	10.8	Armenia	6.9	7.3	6.7
Burkina Faso	12.0	18.3	9.3	Bangladesh	7.4	4.9	18.8
Burundi	23.8	21.6	10.8	Bhutan	43.7	46.1	23.5
Cameroon	13.8	22.5	23.0	Cambodia	13.0	6.4	10.1
Central African Rep.	16.6	23.7	21.8	Indonesia	6.0	1.9	6.1
Comoros	1.8	10.4	8.9	Iraq	5.0	5.0	5.0
Côte d'Ivoire	10.4	10.2	9.2	Jordan	7.9	18.6	8.3
Egypt	7.1	28.0	18.0	Kyrgyz Republic	6.1	6.1	4.0
Ethiopia	10.1	13.3	12.4	Mongolia	5.3	6.5	4.9
Gambia	6.6	13.5	13.9	Nepal	9.0	11.7	13.9
Ghana	16.4	11.6	14.3	Pakistan	3.7	8.1	17.4
Guinea	13.9	18.9	9.5	Papua New Guinea	4.7	12.4	0.9
Guinea Bissau	13.5	15.7	12.8	Sri Lanka	7.8	16.3	15.3
Kenya	18.7	25.1	11.0	Tajikistan	7.4	5.8	8.3
Liberia	6.3	5.6	16.4	Uzbekistan	14.8	11.4	8.5
Madagascar	8.3	9.6	14.8	Vietnam	11.1	6.3	9.8
Malawi	8.2	22.0	9.3	Yemen	4.4	7.6	7.7
Mali	11.2	16.8	8.8				
Mauritania	9.2	14.8	15.9	Azerbaijan	5.7	4.0	10.4
Mozambique	8.8	13.9	7.4	Georgia	6.0	6.4	0.5
Niger	12.2	17.6	9.3	Moldova	7.9	10.7	3.3
Nigeria	11.3	19.8	11.0	Ukraine	4.8	5.1	4.8
Rwanda	21.0	30.1	11.0				
Sierra Leone	11.8	16.2	9.7	Bolivia	11.0	12.6	15.1
South Africa	7.1	6.4	16.8	Ecuador	14.4	15.4	14.0
Tanzania	12.6	29.1	10.7	Guatemala	10.3	10.2	7.4
Togo	11.6	18.6	9.5	Nicaragua	12.1	9.8	9.1
Uganda	11.4	29.7	10.0				
Zambia	17.1	19.7	6.8	Average	10.8	14.4	10.9
				Pop. weighted average	9.0	12.1	11.8
				GDP weighted average	8.1	10.2	10.9

Notes: Authors' calculations based on United Nations COMTRADE and UNCTAD TRAINS data. The average tariff is expressed in percentage points.

Table 4
Expenditure Shares
Male- and Female-Headed Households

Country	Agriculture		Non-Staple Agric.		Manufactures		Non-trade		Other Goods		Home Consumption	
	male	female	male	female	male	female	male	female	male	female	male	female
Benin	41.9	32.9	2.3	4.1	26.5	22.7	12.1	10.4	4.6	6.4	12.6	23.4
Burkina Faso	24.0	29.0	12.2	13.2	15.9	18.1	8.5	12.7	8.6	4.1	30.8	23.0
Burundi	40.1	46.7	11.5	5.2	20.3	19.8	12.3	13.7	10.8	10.7	4.9	3.9
Cameroon	45.5	50.8	6.6	4.7	17.7	15.4	14.5	15.2	6.3	4.5	9.4	9.3
Central African Republic	39.4	43.7	18.7	17.8	21.8	19.7	7.9	7.8	0.2	0.2	12.0	10.8
Comoros	47.5	50.2	9.4	9.7	11.0	9.9	17.5	16.4	5.5	4.4	9.1	9.4
Cote d'Ivoire	35.7	35.8	3.9	3.8	22.8	21.9	21.7	20.0	8.2	5.9	7.9	12.6
Egypt	45.1	47.6	5.1	3.7	13.9	13.1	31.3	31.9	2.1	1.9	2.6	1.8
Ethiopia	21.3	27.8	8.9	9.7	16.7	18.0	2.9	3.1	10.6	8.7	39.6	32.8
Gambia	44.9	47.6	11.6	10.9	11.2	11.7	11.6	14.4	10.5	9.5	10.2	6.0
Ghana	7.3	8.8	1.6	0.9	31.1	30.1	31.4	37.3	16.4	13.0	12.2	9.8
Guinea	32.4	37.1	12.0	11.3	18.2	19.0	12.4	13.9	5.0	5.0	20.0	13.7
Guinea Bissau	50.3	52.3	6.4	6.1	6.5	6.5	7.0	8.4	4.3	3.9	25.4	22.8
Kenya	30.2	30.1	9.8	9.5	23.5	23.2	24.9	24.6	2.3	2.5	9.3	10.1
Liberia	44.7	52.8	7.1	7.3	12.9	11.2	15.1	15.2	2.7	1.9	17.4	11.6
Madagascar	35.6	44.3	7.4	6.3	11.7	13.2	3.6	3.5	0.7	0.7	41.1	32.0
Malawi	26.3	24.1	6.0	4.6	28.8	30.0	7.3	5.3	0.8	0.4	30.7	35.5
Mali	24.1	42.4	7.4	10.1	3.9	7.1	4.8	6.4	0.6	0.2	59.3	33.8
Mauritania	46.6	49.7	11.4	11.6	14.7	14.3	6.8	6.3	0.7	0.6	19.7	17.5
Mozambique	45.1	43.9	5.3	5.3	14.4	15.3	3.9	3.8	1.5	1.6	29.8	30.1
Niger	35.2	42.9	8.7	9.2	17.0	18.0	6.5	7.1	10.3	8.9	22.3	13.8
Nigeria	47.3	51.2	3.7	3.2	18.4	16.1	9.3	10.0	0.5	0.4	20.9	19.2
Rwanda	23.7	25.6	5.2	4.4	10.8	10.3	9.4	8.2	30.9	24.9	20.1	26.6
Sierra Leone	45.8	47.0	10.5	10.0	12.4	12.5	10.5	11.9	4.5	4.1	16.3	14.4
South Africa	28.1	37.2	8.5	8.0	31.7	31.9	17.8	14.2	13.8	8.6	0.1	0.1
Tanzania	27.0	29.9	7.5	6.5	21.4	18.6	12.0	9.4	7.0	6.0	25.1	29.6
Togo	37.8	42.9	7.9	7.5	15.1	15.2	26.3	25.8	6.1	4.6	6.7	4.0

Notes: Authors' calculations based on household survey data. The table reports the average expenditure share for different aggregates of goods for male- and female-headed households.

Table 4 (cont.)
Expenditure Shares
Male- and Female-Headed Households

Country	Agriculture		Non-Staple Agric.		Manufactures		Non-trade		Other Goods		Home Consumption	
	male	female	male	female	male	female	male	female	male	female	male	female
Uganda	27.7	23.4	10.3	7.0	16.6	16.4	16.6	18.2	2.9	1.8	25.9	33.3
Zambia	53.6	53.3	5.0	4.4	6.7	5.2	10.1	10.1	0.7	0.4	21.2	23.9
Armenia	54.8	57.0	8.6	6.7	7.4	6.4	20.1	23.4	0.0	0.0	9.1	6.4
Bangladesh	45.0	47.4	9.2	8.1	13.9	15.3	16.3	15.6	4.4	4.6	11.3	9.0
Bhutan	27.7	25.1	7.2	7.1	25.0	26.6	16.3	14.4	12.4	12.3	11.4	14.4
Cambodia	30.3	34.6	12.5	11.9	16.2	15.4	19.1	17.8	8.6	8.3	13.3	12.1
Indonesia	28.9	30.6	12.2	9.7	11.2	12.0	22.7	23.3	14.2	10.3	10.7	14.1
Iraq	32.1	33.9	5.3	4.9	35.4	33.8	23.0	23.1	3.3	3.6	0.8	0.7
Jordan	34.7	37.4	15.4	14.5	19.0	20.3	29.6	26.2	1.2	1.5	0.2	0.1
Kyrgyz Republic	41.9	43.1	5.5	5.3	24.9	26.6	13.3	14.2	3.9	2.6	10.6	8.3
Mongolia	46.1	53.0	9.1	7.9	13.7	16.4	8.3	10.3	1.1	1.1	21.6	11.3
Nepal	26.7	28.8	5.0	4.1	11.6	12.1	27.2	28.7	4.8	4.5	24.7	21.7
Pakistan	27.5	34.1	7.6	8.2	23.8	19.5	12.7	14.1	6.7	6.6	21.7	17.5
Papua New Guinea	35.7	39.5	12.6	10.2	5.8	5.8	5.0	4.8	13.8	13.4	27.2	26.3
Sri Lanka	32.1	34.1	10.3	9.9	9.4	9.5	19.8	18.1	22.0	20.5	6.3	8.0
Tajikistan	37.4	39.7	5.4	5.9	25.0	23.9	15.1	13.6	3.1	3.5	14.0	13.3
Uzbekistan	35.0	41.5	5.0	5.4	7.4	8.1	10.1	11.9	1.9	1.8	40.6	31.3
Vietnam	36.5	39.6	6.8	5.9	19.9	18.8	15.0	16.0	10.5	10.8	11.4	8.8
Yemen	38.7	44.6	20.7	16.5	17.3	20.2	15.5	14.6	4.4	3.5	3.3	0.7
Azerbaijan	50.9	51.7	6.0	5.2	21.0	20.7	11.6	11.7	1.6	1.6	8.9	9.0
Georgia	33.6	35.2	8.1	7.0	23.4	24.2	27.6	27.6	4.9	4.2	2.3	1.7
Moldova	15.4	17.8	2.2	2.0	31.9	32.5	14.6	16.3	7.7	5.9	28.2	25.5
Ukraine	44.6	44.9	11.8	11.3	20.2	19.9	17.3	16.1	0.1	0.1	5.9	7.7
Bolivia	43.8	44.6	8.1	6.7	16.7	17.1	23.4	25.3	1.3	1.3	6.8	5.0
Ecuador	41.4	44.4	3.8	3.9	16.7	17.0	21.5	21.6	9.0	7.0	7.6	6.0
Guatemala	37.3	39.3	5.2	5.6	19.4	21.1	17.4	19.1	4.7	5.2	15.9	9.7
Nicaragua	38.6	45.0	5.0	4.7	15.9	17.8	18.5	20.2	1.0	0.9	21.1	11.4

Notes: Authors' calculations based on household survey data. The table reports the average expenditure share for different aggregates of goods for male- and female-headed households.

Table 5
Income Shares
Male- and Female-Headed Households

Country	Agriculture		Non-Staple Agric.		Wages		Businesses		Other		Home Production	
	male	female	male	female	male	female	male	female	male	female	male	female
Benin	6.8	15.7	4.2	11.1	6.6	14.4	0.0	0.0	66.0	35.9	16.4	22.8
Burkina Faso	20.1	8.0	3.0	2.2	13.7	10.1	17.3	22.4	11.2	32.2	34.8	25.1
Burundi	38.8	41.3	30.8	25.5	9.8	3.3	8.9	3.6	6.9	22.8	4.8	3.6
Cameroon	16.1	13.3	0.2	0.0	28.4	23.4	22.6	24.6	0.0	0.0	32.7	38.7
Central African Republic	42.6	42.4	9.3	9.1	2.6	1.7	3.5	3.3	3.4	7.2	38.6	36.2
Comoros	25.5	19.2	4.0	2.3	28.9	18.4	16.4	16.4	8.8	20.4	16.4	23.4
Cote d'Ivoire	7.4	7.0	13.5	13.7	22.4	14.8	29.5	28.0	13.8	16.4	13.3	20.1
Egypt	7.6	3.8	7.6	3.8	45.2	20.6	16.7	7.3	22.8	64.3	0.2	0.1
Ethiopia	15.8	10.3	0.6	0.4	5.5	4.2	23.0	27.7	8.5	17.4	46.6	40.0
Gambia	2.8	2.0	7.8	0.9	47.0	39.1	21.3	25.2	5.8	23.3	15.3	9.5
Ghana	9.8	5.1	6.2	3.5	60.7	52.9	0.0	0.0	7.7	23.2	15.7	15.4
Guinea	17.5	17.2	3.3	2.8	7.0	7.2	18.3	17.5	11.6	26.4	42.2	29.0
Guinea Bissau	5.6	5.2	23.3	17.2	23.6	15.4	7.2	9.5	7.6	19.4	32.7	33.3
Kenya	21.8	21.8	3.1	3.3	35.5	34.5	5.3	5.5	17.8	17.3	16.5	17.7
Liberia	9.6	11.6	3.7	2.8	26.6	11.7	27.0	34.5	6.6	17.8	26.5	21.7
Madagascar	28.4	21.6	3.1	2.4	23.3	21.7	12.3	16.5	3.3	12.7	29.6	25.1
Malawi	17.9	20.4	5.2	2.8	23.6	14.2	13.3	10.8	3.2	5.8	36.9	46.0
Mali	8.4	12.3	2.8	2.7	8.2	9.5	10.4	11.2	13.7	34.6	56.5	29.9
Mauritania	14.1	10.3	0.0	0.0	4.1	2.3	10.6	7.7	27.1	46.2	44.0	33.5
Mozambique	11.4	8.2	8.7	3.2	17.0	10.6	10.6	9.7	7.2	16.9	45.1	51.5
Niger	17.7	12.3	3.2	1.3	4.0	4.3	1.4	2.1	36.8	56.5	36.8	23.5
Nigeria	15.6	15.1	6.2	2.5	33.2	32.8	9.6	13.8	3.4	10.8	31.9	24.9
Rwanda	11.1	9.3	3.8	3.2	26.9	20.0	2.8	2.0	11.9	11.8	43.5	53.6
Sierra Leone	19.8	15.8	4.8	4.0	12.1	7.9	12.3	16.2	17.1	26.6	33.8	29.5
South Africa	0.7	0.5	0.0	0.0	67.0	35.4	0.0	0.0	31.5	63.2	0.8	0.9
Tanzania	10.6	10.9	3.6	2.9	25.5	22.5	8.4	5.0	10.4	11.8	41.4	46.9
Togo	9.5	5.7	6.8	5.3	33.5	18.3	35.5	43.4	6.7	20.5	8.0	6.7

Notes: Authors' calculations based on household survey data. The table reports the average income share for different production activities for male- and female-headed households.

Table 5 (cont.)
Income Shares
Male- and Female-Headed Households

Country	Agriculture		Non-Staple Agric.		Wages		Businesses		Other		Home Production	
	male	female	male	female	male	female	male	female	male	female	male	female
Uganda	9.6	9.8	2.7	3.0	30.4	19.5	17.9	18.9	13.2	14.1	26.1	34.7
Zambia	6.3	3.9	1.9	1.0	23.5	12.8	13.5	12.7	16.8	25.2	38.0	44.4
Armenia	10.2	7.1	0.2	0.0	37.4	30.4	8.0	3.4	34.9	52.4	9.4	6.6
Bangladesh	32.5	36.0	2.2	1.8	33.6	17.4	16.0	4.0	8.1	36.5	7.6	4.2
Bhutan	11.9	15.5	0.0	0.0	49.6	30.9	8.8	10.4	7.7	10.7	22.0	32.5
Cambodia	25.5	19.3	0.5	0.3	30.0	33.8	24.1	21.8	4.2	9.4	15.7	15.4
Indonesia	5.3	1.9	1.4	0.6	40.9	27.1	0.6	0.4	19.2	28.1	32.6	41.9
Iraq	8.3	7.0	1.6	1.6	51.0	35.2	12.5	6.8	25.7	48.9	0.9	0.5
Jordan	1.4	3.4	1.9	3.5	47.8	28.2	10.0	2.0	37.9	61.4	0.9	1.5
Kyrgyz Republic	13.8	9.6	1.6	1.2	41.1	39.0	14.6	7.7	21.5	37.3	7.4	5.2
Mongolia	11.3	5.8	0.4	0.1	39.1	34.8	9.4	6.2	27.5	46.3	12.3	6.7
Nepal	4.4	3.3	1.4	0.7	29.0	17.2	12.9	6.0	16.3	38.0	36.0	34.9
Pakistan	7.8	4.7	3.2	2.3	48.5	21.1	12.9	4.3	9.7	53.0	17.8	14.6
Papua New Guinea	13.5	15.3	6.9	4.6	15.2	12.8	9.6	9.8	17.6	19.9	37.2	37.7
Sri Lanka	14.6	8.3	4.5	4.7	51.0	41.3	20.9	13.9	0.0	0.0	9.0	31.8
Tajikistan	0.8	1.6	1.7	0.9	38.9	37.5	8.8	7.1	21.2	28.0	28.6	24.9
Uzbekistan	8.3	4.5	0.2	0.1	20.5	19.5	11.3	10.9	17.8	30.2	41.8	34.8
Vietnam	23.7	13.7	3.9	2.6	34.2	38.4	20.0	18.4	11.1	19.0	7.2	7.9
Yemen	8.0	5.7	9.4	6.5	46.1	13.2	16.3	3.6	17.2	70.4	3.0	0.6
Azerbaijan	29.0	27.6	2.0	1.6	27.6	18.6	3.0	2.6	24.4	35.1	14.0	14.4
Georgia	8.9	4.1	2.0	1.8	31.8	24.0	9.1	5.2	46.0	63.6	2.2	1.3
Moldova	7.1	3.2	2.4	1.8	34.2	25.1	2.2	1.1	21.5	33.2	32.7	35.7
Ukraine	2.3	2.9	0.0	0.0	53.9	40.9	0.2	0.1	39.2	50.2	4.4	5.9
Bolivia	7.1	4.0	8.7	4.5	38.0	30.0	28.2	24.7	11.0	32.0	7.0	4.9
Ecuador	10.4	11.0	1.3	0.6	51.0	41.0	17.9	13.5	13.4	28.5	6.0	5.4
Guatemala	7.1	3.9	2.7	3.5	46.6	39.9	17.7	18.9	11.3	24.5	14.6	9.3
Nicaragua	12.8	7.4	3.8	1.0	39.8	41.5	18.5	18.3	8.7	22.7	16.5	9.1

Notes: Authors' calculations based on household survey data. The table reports the average income share for different production activities for male- and female-headed households.

Table 6
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)	5.58 (0.05)	3.52 (0.11)	-2.05 (0.12)	-6.07 (0.03)	-6.57 (0.08)	-0.50 (0.09)
Cameroon	-6.31 (0.08)	-8.52 (0.12)	-2.21 (0.14)	5.96 (0.07)	4.59 (0.10)	-1.37 (0.12)	-12.27 (0.04)	-13.11 (0.06)	-0.84 (0.08)
Mali	0.48 (0.05)	-1.70 (0.26)	-2.18 (0.27)	2.95 (0.03)	3.27 (0.16)	0.32 (0.17)	-2.47 (0.05)	-4.97 (0.24)	-2.50 (0.24)
Gambia	-1.46 (0.14)	-3.61 (0.26)	-2.15 (0.29)	6.31 (0.11)	5.15 (0.19)	-1.16 (0.22)	-7.77 (0.09)	-8.76 (0.19)	-0.99 (0.21)
Nicaragua	-1.20 (0.08)	-3.26 (0.07)	-2.06 (0.11)	4.69 (0.07)	3.16 (0.06)	-1.54 (0.09)	-5.89 (0.04)	-6.41 (0.05)	-0.52 (0.07)
Ethiopia	-1.75 (0.06)	-3.45 (0.07)	-1.69 (0.09)	5.45 (0.04)	4.12 (0.05)	-1.33 (0.07)	-7.20 (0.03)	-7.57 (0.04)	-0.37 (0.06)
Uzbekistan	-3.13 (0.04)	-4.65 (0.08)	-1.52 (0.09)	3.52 (0.03)	3.18 (0.05)	-0.34 (0.06)	-6.65 (0.04)	-7.83 (0.07)	-1.18 (0.08)
Niger	-1.80 (0.06)	-3.30 (0.18)	-1.50 (0.19)	4.44 (0.05)	3.56 (0.14)	-0.88 (0.15)	-6.24 (0.03)	-6.86 (0.10)	-0.62 (0.10)
Ghana	2.24 (0.07)	0.96 (0.10)	-1.28 (0.12)	6.16 (0.06)	4.80 (0.09)	-1.36 (0.11)	-3.92 (0.03)	-3.84 (0.05)	0.08 (0.06)
Pakistan	-2.28 (0.04)	-3.54 (0.10)	-1.26 (0.11)	3.36 (0.03)	2.42 (0.08)	-0.95 (0.08)	-5.64 (0.02)	-5.95 (0.06)	-0.31 (0.06)
Vietnam	-0.76 (0.06)	-2.00 (0.10)	-1.25 (0.11)	6.39 (0.05)	4.86 (0.08)	-1.53 (0.10)	-7.14 (0.03)	-6.86 (0.05)	0.28 (0.06)
Bolivia	-2.53 (0.09)	-3.72 (0.11)	-1.20 (0.14)	4.02 (0.08)	2.83 (0.10)	-1.19 (0.12)	-6.54 (0.04)	-6.55 (0.07)	-0.01 (0.08)
Bangladesh	-0.29 (0.06)	-1.48 (0.15)	-1.19 (0.16)	6.84 (0.06)	5.91 (0.13)	-0.92 (0.15)	-7.13 (0.02)	-7.39 (0.05)	-0.26 (0.06)
Ecuador	-2.70 (0.04)	-3.79 (0.05)	-1.09 (0.06)	4.54 (0.03)	3.80 (0.05)	-0.74 (0.06)	-7.25 (0.02)	-7.60 (0.04)	-0.35 (0.04)
Madagascar	1.26 (0.05)	0.18 (0.09)	-1.08 (0.10)	5.15 (0.04)	4.35 (0.07)	-0.80 (0.08)	-3.88 (0.02)	-4.17 (0.04)	-0.28 (0.05)
Guatemala	-1.61 (0.03)	-2.67 (0.05)	-1.06 (0.06)	3.16 (0.03)	2.26 (0.04)	-0.91 (0.05)	-4.77 (0.02)	-4.92 (0.03)	-0.15 (0.04)
Papua New Guinea	-1.60 (0.05)	-2.63 (0.17)	-1.03 (0.18)	3.05 (0.05)	2.77 (0.12)	-0.28 (0.13)	-4.64 (0.05)	-5.39 (0.18)	-0.75 (0.19)
Cambodia	3.26 (0.12)	2.27 (0.22)	-0.99 (0.25)	8.54 (0.10)	7.94 (0.20)	-0.60 (0.22)	-5.28 (0.04)	-5.68 (0.08)	-0.40 (0.09)
Yemen	-2.59 (0.03)	-3.54 (0.09)	-0.95 (0.10)	2.80 (0.02)	2.25 (0.06)	-0.55 (0.07)	-5.39 (0.02)	-5.79 (0.07)	-0.40 (0.07)
Mongolia	0.11 (0.03)	-0.75 (0.05)	-0.85 (0.05)	3.38 (0.02)	2.96 (0.03)	-0.42 (0.03)	-3.27 (0.02)	-3.71 (0.03)	-0.44 (0.04)
Liberia	-1.35 (0.06)	-2.18 (0.08)	-0.83 (0.10)	3.08 (0.05)	2.69 (0.07)	-0.39 (0.09)	-4.44 (0.03)	-4.87 (0.04)	-0.44 (0.05)

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 6 (cont.)
Countries with Anti-Female Bias From Protectionism

Country	Welfare Effects			Income Effects			Expenditure Effects		
	Males	Females	Bias	Males	Females	Bias	Males	Females	Bias
Tanzania	-3.54 (0.26)	-4.37 (0.13)	-0.83 (0.29)	4.90 (0.21)	4.53 (0.09)	-0.37 (0.23)	-8.45 (0.19)	-8.90 (0.09)	-0.45 (0.21)
Egypt	-2.71 (0.03)	-3.51 (0.04)	-0.80 (0.05)	4.06 (0.02)	2.32 (0.03)	-1.74 (0.04)	-6.77 (0.02)	-5.84 (0.04)	0.93 (0.04)
Cote d'Ivoire	-2.91 (0.08)	-3.69 (0.05)	-0.79 (0.10)	4.16 (0.07)	3.57 (0.04)	-0.59 (0.08)	-7.06 (0.04)	-7.26 (0.03)	-0.20 (0.05)
Sri Lanka	0.45 (0.04)	-0.31 (0.07)	-0.76 (0.09)	4.51 (0.04)	3.96 (0.07)	-0.55 (0.08)	-4.05 (0.02)	-4.26 (0.04)	-0.21 (0.05)
Zambia	-5.75 (0.06)	-6.51 (0.08)	-0.76 (0.10)	3.29 (0.05)	2.17 (0.06)	-1.11 (0.08)	-9.04 (0.03)	-8.69 (0.05)	0.35 (0.06)
Guinea	-2.74 (0.05)	-3.45 (0.10)	-0.72 (0.11)	5.03 (0.04)	4.63 (0.08)	-0.40 (0.09)	-7.77 (0.03)	-8.09 (0.06)	-0.32 (0.07)
Tajikistan	-1.84 (0.06)	-2.42 (0.12)	-0.58 (0.13)	2.81 (0.04)	2.54 (0.08)	-0.26 (0.09)	-4.65 (0.04)	-4.97 (0.10)	-0.32 (0.10)
Nepal	-1.24 (0.04)	-1.80 (0.05)	-0.56 (0.06)	3.09 (0.03)	2.73 (0.03)	-0.35 (0.04)	-4.33 (0.03)	-4.53 (0.04)	-0.21 (0.05)
Moldova	-0.52 (0.05)	-1.06 (0.04)	-0.54 (0.06)	2.29 (0.04)	1.87 (0.03)	-0.42 (0.05)	-2.81 (0.02)	-2.93 (0.03)	-0.12 (0.04)
Sierra Leone	-4.13 (0.07)	-4.64 (0.11)	-0.51 (0.13)	3.24 (0.05)	2.90 (0.08)	-0.34 (0.10)	-7.37 (0.04)	-7.54 (0.06)	-0.17 (0.07)
South Africa	-2.34 (0.03)	-2.84 (0.04)	-0.50 (0.05)	1.78 (0.03)	1.45 (0.03)	-0.33 (0.04)	-4.11 (0.02)	-4.29 (0.02)	-0.18 (0.03)
Kyrgyz Republic	-0.43 (0.03)	-0.91 (0.04)	-0.49 (0.05)	2.70 (0.02)	2.45 (0.03)	-0.24 (0.03)	-3.12 (0.02)	-3.37 (0.02)	-0.24 (0.03)
Guinea Bissau	-1.87 (0.08)	-2.34 (0.14)	-0.47 (0.16)	3.60 (0.05)	3.37 (0.09)	-0.24 (0.10)	-5.48 (0.08)	-5.70 (0.14)	-0.23 (0.16)
Mauritania	1.40 (0.05)	0.98 (0.09)	-0.42 (0.10)	7.72 (0.03)	7.37 (0.06)	-0.35 (0.06)	-6.31 (0.04)	-6.39 (0.07)	-0.08 (0.08)
Togo	-2.02 (0.07)	-2.44 (0.11)	-0.42 (0.13)	5.11 (0.06)	4.76 (0.11)	-0.34 (0.12)	-7.13 (0.03)	-7.20 (0.06)	-0.08 (0.07)
Mozambique	-3.54 (0.05)	-3.95 (0.07)	-0.40 (0.08)	3.72 (0.04)	3.22 (0.05)	-0.50 (0.06)	-7.27 (0.03)	-7.17 (0.05)	0.10 (0.06)
Nigeria	-3.23 (0.04)	-3.60 (0.11)	-0.37 (0.12)	5.09 (0.04)	4.80 (0.09)	-0.28 (0.10)	-8.32 (0.02)	-8.41 (0.05)	-0.08 (0.06)
Armenia	-2.38 (0.04)	-2.64 (0.05)	-0.26 (0.06)	1.79 (0.03)	1.45 (0.03)	-0.34 (0.05)	-4.17 (0.02)	-4.09 (0.03)	0.08 (0.03)
Azerbaijan	-2.47 (0.06)	-2.70 (0.11)	-0.23 (0.12)	3.74 (0.05)	3.38 (0.09)	-0.36 (0.10)	-6.20 (0.03)	-6.08 (0.07)	0.13 (0.08)
Georgia	-0.94 (0.03)	-1.17 (0.03)	-0.23 (0.04)	1.32 (0.02)	1.00 (0.02)	-0.31 (0.03)	-2.26 (0.01)	-2.17 (0.02)	0.08 (0.02)
Iraq	-1.61 (0.01)	-1.73 (0.02)	-0.12 (0.02)	1.86 (0.01)	1.68 (0.02)	-0.18 (0.02)	-3.47 (0.01)	-3.41 (0.02)	0.06 (0.02)

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 7
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)	5.25 (0.07)	5.09 (0.11)	-0.16 (0.13)	-5.11 (0.06)	-4.92 (0.09)	0.20 (0.10)
Ukraine	-3.27 (0.03)	-3.20 (0.01)	0.07 (0.04)	1.39 (0.02)	1.34 (0.01)	-0.05 (0.02)	-4.66 (0.02)	-4.54 (0.01)	0.12 (0.02)
Kenya	-2.93 (0.06)	-2.80 (0.17)	0.13 (0.18)	5.70 (0.05)	5.29 (0.15)	-0.41 (0.16)	-8.63 (0.04)	-8.09 (0.12)	0.55 (0.13)
Malawi	-2.40 (0.05)	-2.26 (0.08)	0.15 (0.10)	4.66 (0.04)	3.96 (0.06)	-0.69 (0.07)	-7.06 (0.03)	-6.22 (0.06)	0.84 (0.06)
Comoros	0.22 (0.06)	0.37 (0.11)	0.15 (0.12)	3.20 (0.04)	3.24 (0.09)	0.04 (0.10)	-2.98 (0.04)	-2.86 (0.06)	0.12 (0.07)
Indonesia	-1.90 (0.02)	-1.69 (0.04)	0.22 (0.05)	1.41 (0.01)	1.14 (0.03)	-0.27 (0.03)	-3.32 (0.02)	-2.82 (0.04)	0.49 (0.04)
Jordan	-4.09 (0.04)	-3.84 (0.10)	0.24 (0.11)	4.22 (0.02)	4.31 (0.05)	0.09 (0.05)	-8.31 (0.04)	-8.15 (0.09)	0.16 (0.10)
Burundi	-0.45 (0.11)	-0.09 (0.20)	0.36 (0.23)	8.58 (0.10)	8.89 (0.17)	0.31 (0.20)	-9.03 (0.05)	-8.98 (0.10)	0.05 (0.11)
Central African Republic	-4.30 (0.08)	-3.72 (0.15)	0.58 (0.17)	6.50 (0.08)	7.01 (0.14)	0.51 (0.16)	-10.80 (0.05)	-10.72 (0.07)	0.08 (0.08)
Bhutan	0.33 (0.12)	1.73 (0.20)	1.40 (0.24)	14.16 (0.10)	15.49 (0.17)	1.32 (0.20)	-13.84 (0.07)	-13.76 (0.11)	0.08 (0.13)
Uganda	-3.02 (0.16)	-1.59 (0.07)	1.43 (0.17)	4.97 (0.12)	4.51 (0.05)	-0.46 (0.13)	-7.99 (0.10)	-6.10 (0.04)	1.89 (0.11)
Benin	-4.01 (0.11)	-1.83 (0.08)	2.18 (0.13)	4.10 (0.07)	5.77 (0.05)	1.67 (0.09)	-8.11 (0.07)	-7.60 (0.04)	0.51 (0.08)

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.