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Investigating the Benefit Incidence of Import Tariffs changes among Zimbabwean Households (2009-2014)

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Abstract

Using import tariffs data from the Zimbabwe Revenue Authority and FinScope's Income and Expenditure Surveys, this study estimates the benefit incidence of import tariffs in Zimbabwe over the period 2009-2014. The incidence of import tariffs and expenditure shares are compared using Lorenz curve estimations; over time, between male and female-headed households, rural and urban households, and household income groups. The findings indicate that the import tariffs were regressive over the given period, especially in rural areas. Poor households tended to bear much of the import tariff burden when compared to non-poor households. Female-headed households also bore a higher import tariff burden compared to male-headed households. These results suggest for inequality reducing trade policy reforms. Importantly, designing import tariff structures that cushion poor households from the negative import tariffs effect is important for Zimbabwe.

Keywords: Benefit Incidence, Import Tariffs, Inequality

1. Introduction

Prior to the 1990s countries were more focused on economic growth rather than on the associated distribution of income and expenditure in society [2,3]. This partly fueled income inequality as benefits of economic growth were being shared among a select few income groups [1]. Hence, international organisations such as The World Bank, Organisation for Economic Co-operation and Development (OECD) and Department for International Development (DFID), among others, began championing for inclusive growth also known as broad-based growth, shared-growth and pro-poor growth (OECD, 2008) This has been supported by various studies that assessed how governments' policies affected household welfare across the income distribution.

Existing literature shows that government policies can be transmitted to household welfare, as proxied by consumption expenditure, in various ways [4,11]. For instance, the government may embark on a redistributive tax-benefit policy which taxes the rich heavily and gives state subsidies and social grants to the poor [12]. Apart from direct cash benefits, expansionary monetary and fiscal policies may, for instance, reduce direct and indirect taxes and interest rates which supposedly increase household purchasing power, ceteris paribus. A similar effect pertains to trade liberalisation, an example being an import tariff reduction for some goods. Based on consumption patterns, households which consume the affected goods with a price inelastic import elasticity of demand may gain some purchasing power, while those that do not are left out [13-15]. For elucidation, an import tariff reduction on luxury (basic) goods will benefit the welfare of the high (low) income group more than that of the low (high) income group. The concept that different income groups may benefit differently from government policies has popularised benefit incidence analyses of government policies/projects since Brennan (1976) This has been given more prominence by the growing importance of household welfare and equity in economic development [4,5].

An analysis of extant literature on benefit incidence analysis of import tariff-related policies shows that this is more of a developing rather than developed countries' issue Cornes, 1992; Some of the related studies, however, focus on tax in general rather than specific tax-types which brings ambiguity to policymakers when incorporating resultant findings Refaquat, 2003; Chen et al., 2001; OECD, 2000) Other studies also compare the benefit of import tariffs between overall populations in imposing and receiving countries [4,5,8,16-20]. While this is educative, it leaves us unaware of the intra-country distribution of benefits, which is crucial for studying household welfare. Furthermore, some of the studies are biased as they allow for temporal variations in import tariffs while holding constant household income and expenditure patterns over time [11,21].

The assumption that household consumption patterns are non-responsive to price changes owes to limited availability of income and expenditure survey data. This constraint has also resulted in very few studies of benefit incidence analyses of import tariffs on household welfare in African countries; especially those in southern Africa [11,22]. Yet, such analyses will be crucial for initiatives to address inequity in household welfare which is pro-socioeconomic development. Moreover, the region

is endowed with some countries that encountered atypical political-economic phases such as Zimbabwe. Hence, it is unclear whether findings of current literature can be generalised to such countries.

In light of the above, this study intends to investigate the benefit incidence of import tariffs in the case of Zimbabwe over the period 2009-2014. This will be achieved through satisfying three objectives, i) To investigate the benefit incidence of import tariffs on Zimbabwean households in general, through their consumption expenditure patterns, ii) To compare the benefit incidence of import tariffs between male- and female-headed households in Zimbabwe, iii) To compare the benefit incidence of import tariffs between households in rural and urban areas of Zimbabwe.

The analysis is crucial as to the best of our knowledge currently no study has done a benefit incidence analysis of import tariffs in Zimbabwe. The only studies closest to the present study are which analysed the effect of import tariff changes on household poverty in Zimbabwe within a computable general equilibrium framework [23,21]. The studies established that import tariff reduction had a welfare-enhancing effect which differed by household income level as well as geographic location, but did not distinguish the households by gender of headship. Notably, the studies' period of analysis was before the country's economic crisis, Zimbabwe still had its sovereign currency. The present study intends to focus on the period 2009-2014; post-economic crisis. This is a peculiar period in which Zimbabwe adopted a multiple-currency and a cash budget economic system (GoZ, 2009). These policies restricted fundraising options for the country which made import tariff increases attractive.

It is thus important to investigate the incidence of the import tariff burden across household income groups, considering gender differences in household headship and geo-spatial location. Moreover, the same period was characterised by deterioration in many households' welfare (Zimbabwe National Statistics Agency [23]. Thus there is a need to determine whether the contemporaneous import tariffs contributed to the welfare decline i.e. were they progressive or regressive. Hopefully the study's findings, apart from extending typical literature to southern African countries, will be influential for mitigating household poverty and inequality in Zimbabwe. They will also serve as lessons for countries that may consider adopting multiple currency and cash budget economic systems.The rest of the paper is structured as follows. Section 2 discusses the research methodology and data. Section 3 discusses the findings of the study while section 4 concludes.

2. Methodology and Data

Inspired by the distribution channel in Winters (2000b) conceptual framework, this section discusses the methodology used to analyse the burden of import tariffs across the distribution of household expenditure in Zimbabwe for the period 2009-2014. The study is aware that import tariff transmission to domestic prices is not a smooth process as many agencies and regulations are involved; nevertheless, the study assumes that the transmission is smooth. This serves to lessen the burden of modeling all the variables which affect goods prices from the port of entry to the retail shops for which data is not readily available. Such obstacles include packaging regulation, transport regulation, quality checks, and other tax forms other than the import tariffs [24]. Given this assumption, the methodology of this study closely follows Aaron and McGuire (1970); Demery et al., (1996) and Demery (2000).

In the model total domestic expenditure on commodity, *i* can be specified as:

$$E_i^d \equiv p_i^d q_i = p_i^w (1+t_i) q_i \quad \text{.....[1.1]}$$

$$= p_i^w q_i + p^w t_i q_i \quad \text{.....[1.2]}$$

where p_i^d is the domestic price of commodity *i*, q_i is the quantity of commodity *i*, p_i^w is the world price of commodity i, and t_i is the import tariff rate of commodity i.

Given that the study is focusing on a country using a multiple-currency economic system, equation 1.1 will not include the exchange rate component which will have a direct effect on prices and import tariffs. For the period 2009-2014 Zimbabwe was not using its own currency thus, it did not have control over the exchange rates of the basket of foreign currencies that it employed as legal tender. For the sake of clarity, the period was marked by the populace's loss of confidence in the financial system such that most bank balances were kept at zero [25,26]. In fact, most transactions were done on the informal market-making identification of a single currency which was used more problematic. Also, the Central Bank's value of money supply for this period is highly treacherous.

Focusing only on imported goods and setting $p_i^w = 1$ yields:

$$E_i^d = q_i (1+t_i) \quad \text{..... [1.3]}$$

Dividing both sides of equation 1.3 by $\frac{t_i}{(1+t_i)}$ and rearranging results in:

$$t_i q_i = \frac{t_i E_i^d}{(1+t_i)} \quad \text{..... [1.4]}$$

Equation 1.4 can be simplified to:

$$t_i q_i = E_i^d - \frac{E_i^d}{(1+t_i)} \quad \text{..... [1.5]}$$

where $t_i\, q_i$ is the total implicit import tariff paid by one household on commodity i. Summing this over all households and over commodity i, yields T_i which is implicit tariff expenditure over the total of commodity i consumed It should be noted that T_i can be lower or greater than the actual tariff revenue collected by the government for the year i. Implicit tariffs expenditure is calculated using scheduled import tariffs which do not consider rebates and import tariffs holidays. Thus, the actual and implicit import tariffs expenditure will be different. This is because the estimations do not factor in the substitution effect, as consumers may shift to commodities whose import tariffs would have been reduced. The estimation also does not take into consideration household production due to data constraints. This omission is not likely to affect results given that local production was low during the period 2009-2014 and Zimbabwe was heavily relying on imported products [27].

The import tariffs benefit incidence on poor and non-poor households hinges on the share of import tariffs expenditure paid by each group and the level of import tariffs on commodities. The incidence of import tariff will be higher on a certain income group if import tariffs are high on the goods mostly consumed by that particular group. Following [11] the group-specific expenditure on import tariffs X_j will be specified as:

$$X_j = \sum_{i=1}^{I} E_{ij} \frac{T_i}{E_i} \equiv \sum_{i=1}^{I} \frac{E_{ij}}{E_i} T_i \quad \text{.....[1.6]}$$

where j represents a specific group (poor or non-poor, rural or urban, male or female-headed household), thus X_j is the total expenditure on import tariffs incurred by income group j and E_{ij} is the total expenditure on product i by income group j. As per the study's objectives, household expenditure patterns may be sensitive to geographic location e.g. rural and urban households. To include the location factor equation 1.6 is modified to:

$$X_j = \sum_{k=1}^{K} \sum_{i=1}^{I} \frac{E_{ijk}}{E_J} T_{ik} \quad \text{.....[1.7]}$$

where k represents a location. Dividing equation [1.7] by $T = \sum_{K=1}^{k} \sum_{i=1}^{I} T_{ik}$ yields the incidence of import tariffs, which can be presented as;

$$x_j = \sum_{k=1}^{K} \sum_{i=1}^{I} e_{ijk} t_{ik} \quad \text{.....[1.8]}$$

where $e_{ijk} = \frac{E_{ijk}}{E_i}$ is the share of expenditure by households in group j at a location k, and $t_{ik} = T_{ik} / T_i$ the share of tariffs cost for each commodity i in a location k in total tariff cost of commodity i. The study will break x_j into deciles of total household expenditure in order to compare the tariff burden for poor and non-poor households. The cumulative distribution of x_j will be compared to the cumulative distribution of the expenditure across the deciles. Lorenz curves of the two distributions will be constructed to give a visual comparison of the distribution. If the Lorenz curve of the import tariffs incidence is above the Lorenz curve of household expenditure, it implies that import tariffs are regressive since a lower share of expenditure will be associated with a higher import tariffs incidence. Comparison of the behaviour of will be done across gender of the household head and geographic location.

3. Data Description

This study used data from two sources, Zimbabwe's import tariffs handbook produced by ZIMRA, and Household Income and Expenditure Surveys for 2011/12 and 2013/14 produced by FinScope in conjunction with the Zimstat. The latter consumer surveys are nationally representative and were designed to collect information on financial inclusion in Zimbabwe. Data were collected for 3 984 and 4 000 households in 2011 and 2013, respectively. The sample delimitation process is shown in Table 1 which presents sizes of the original and the final samples used in the analysis. A significant number of households reported a monthly income in the range $0 - $100. According to the Zimstat monthly price surveys, such income levels were exceptionally low given the average prices of basic commodities . Consequently, this study only kept households that had a minimum monthly income of at least US$100. This amounted to dropping 17 percent (37 percent) of households in the 2011/12(2013/14) consumption surveys as their income fell below a minimum threshold. Thus the original sample of 3 984 households in 2011/12 dropped to 3 300, while the 4 000 house-

holds in 2013/14 dropped to 2500. This data cleaning process is opined to not have brought non-trivial biases to our benefit incidence analysis as the dropped households could have erroneously reported their incomes, to begin with.

	2011(before cleaning)	2011 (after cleaning)	2013 (before cleaning)	2013 (after cleaning)
Sample size	3984	3300	4000	2500
Male (percent)	40	45	43	46
Female (percent)	60	55	57	43
Rural (percent)	65	63	70	65
Urban (percent)	35	37	30	35

Table 1: Sample delimitation process

Table 2 shows descriptive statistics for the sample of analysis. The monthly income statistics show some variation between the two surveys. For instance, monthly income in 2013 was on average higher and less dispersed than that in 2011. Average income for 2011 was in the range US$100 - US$5 000 compared to US$100 - US$7 000 for 2013. This income distribution pattern is also supported by the Lorenz curve in Appendix A1.

	Variable	Observations	Mean/proportion	Std. Dev.	Minimum	Maximum
2011	Province:					
	Manicaland	3300	0.13	0.34	0	1
	Mashonaland Central	3300	0.09	0.28	0	1
	Mashonaland East	3300	0.11	0.31	0	1
	Mashonaland West	3300	0.11	0.32	0	1
	Matebeleland North	3300	0.05	0.22	0	1
	Matebeleland South	3300	0.05	0.22	0	1
	Midlands	3300	0.12	0.32	0	1
	Masvingo	3300	0.11	0.31	0	1
	Harare	3300	0.17	0.38	0	1
	Rural area	3300	0.65	0.48	0	1
	Monthly income	3300	242.35	469.60	100	5000
2013	Province:					
	Manicaland	2500	0.14	0.34	0	1
	Mashonaland Central	2500	0.08	0.27	0	1
	Mashonaland East	2500	0.10	0.30	0	1
	Mashonaland West	2500	0.11	0.31	0	1
	Matebeleland North	2500	0.05	0.21	0	1
	Matebeleland South	2500	0.05	0.22	0	1
	Midlands	2500	0.12	0.32	0	1
	Masvingo	2500	0.11	0.31	0	1
	Harare	2500	0.19	0.39	0	1
	Rural area	2500	0.62	0.49	0	1
	Monthly income	2300	270.91	375.45	100	7000

Table 2: Summary statistics of the FinScope consumer surveys

The 2011/12 and 2013/14 household consumer surveys also captured detailed information on household expenditures on products used for the analysis. Specifically, respondents were asked about their expenses on preserved food, beverages, manufactured food, cloth materials, clothes and footwear. Table 3 presents the monthly summary statistics of these household expenditures in US$. The mean expenditure on preserved food products was $24.80 in 2011 compared to $28.45 in 2013. A temporal drop in the mean expenditure on manufactured food from $41.33 to $37.93 was also observed. A similar trend occurred for expenditure on wearing clothes, which dropped by $1.22 from $24.23 in 2011. Household monthly average expenditure on wearing clothes drastically declined from $24.23 in 2011 to $1.22 in 2013. Thus there were notable variations in average monthly expenditures across products and time period.

	Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
2011	Expenditure on preserved food	3300	24.80	40.83	7.5	375
	Expenditure on Beverages	3300	33.07	54.44	10	500
	Expenditure on manufactured food	3300	41.33	68.05	12.5	625
	Expenditure on cloth materials	3300	4.85	9.39	2	100
	Expenditure on wearing clothes	3300	24.23	46.96	10	500
	Expenditure on footwear	3300	20.13	36.46	8	300
2013	Expenditure on preserved food	2500	28.45	39.42	10.5	525
	Expenditure on Beverages	2500	47.41	65.70	17.5	875
	Expenditure on manufactured food	2500	37.93	52.56	14	700
	Expenditure on cloth materials	2500	4.08	6.28	1	90
	Expenditure on wearing clothes	2500	1.22	1.88	0.3	270
	Expenditure footwear	2500	1.14	1.09	4	230

Source: Calculations using FinScope consumer surveys.

Table 3: Summary statistics of expenditure on food and cloth products (US$)

Table 4 further unpacks percentages of household expenditure allotted to the 5 goods in question across deciles of total household expenditure – decile 1 (10) represents the lowest (highest) income households. We presume a positive correlation between the percentage of expenditure on a product, as per column headings in Table 4, and its consumption. This means we are equating expenditure to consumption. Panel A of Table 4 shows consumption patterns based on data for 2011/12 while those for 2013/14 are captured in Panel B.

Poor households (the first 3 deciles) spend relatively more of their income on preserved food, beverages and manufactured food compared to the non-poor (last 3 deciles). The latter tend to spend relatively more on clothes and footwear. Thus, a pro-poor trade policy would be expected to charge relatively lower import tariffs on food and beverages than footwear and clothing. Panel B shows that the household expenditure distribution of 2013/14 is similar to that of 2011/14.

Panel A – 2011/12						
Decile	**Expenditure on preserved food**	**Expenditure on Beverages**	**Expenditure on manufactured food**	**expenditure on clothes materials**	**Expenditure on wearing clothes**	**Expenditure on footwear**
1	31.02	15.17	21.06	5.64	14.38	12.74
2	30.13	17.95	20.48	6.15	14.97	10.97
3	29.37	13.92	21.02	7.39	15.07	13.23
4	26.19	12.75	20.34	8.21	17.85	14.98
5	22.91	10.98	16.39	8.98	24.76	16.08
6	19.58	9.75	13.34	10.01	31.05	16.92
7	18.37	7.64	11.74	10.25	34.88	17.12
8	15.89	3.88	10.28	10.49	41.77	17.69
9	14.02	2.66	8.04	11.25	46.24	17.79
10	13.44	2.49	6.69	13.59	45.75	18.04
Panel B – 2013/14						
1	35.85	13.35	26.97	3.64	12.33	7.91
2	34.96	13.67	26.62	5.65	12.94	6.17
3	31.02	13.92	27.22	7.39	13.02	7.74
4	31.02	16.73	30.49	8.21	15.80	10.15
5	25.74	12.55	26.64	8.18	16.71	10.25
6	25.61	11.06	25.23	9.01	19.00	10.09
7	19.20	11.93	20.03	9.25	29.33	10.29
8	17.72	8.52	21.14	10.49	31.12	11.06

9	16.85	6.47	19.34	11.35	33.19	12.96
10	15.67	5.86	18.90	12.59	33.79	13.21

Source: Calculation using FinScope Consumer surveys for 2011/12 and 2013/14

Table 4: Household consumption pattern for 2011 and 2013 (US$)

However, poorer households allocated 11.7 percent more on food and beverages in 2013 while the non-poor reduced their expenditure on clothes and footwear by about 23.7 percent. Thus, on average, households' expenditure on food and beverage increased whilst the one on clothes and footwear decreased. The import tariffs related to above-mentioned expenditures are displayed in Table 5, as previously mentioned these were sourced from the country's import tariffs handbook. The tariffs vary across months but yearly averages were constructed for 2009 to 2014. Changes in import tariffs over time were updated using the period's statutory instruments. To elucidate whether there were indeed any variations in import tariffs over the given time, Table 5 shows yearly averages of ad valorem import tariffs across product lines.The import tariffs were different across products over the period 2009-2014. For instance, food products consistently had lower average tariffs than footwear products. Also, some product lines exhibited relatively larger temporal average import tariff changes than others.

Variable	2009	2010	2011	2012	2013	2014
Processing and preserving of food and fish products*	21.18	44.95	25.63	29.70	17.79	18.26
Food products*	14.60	22.12	25.11	27.72	21.67	23.20
Beverages and tobacco products*	27.14	31.15	41.37	55.50	32.10	27.78
Spinning, weaving and finishing of textiles; and other textiles *	20.93	37.99	26.96	31.92	18.92	21.87
Wearing apparel products*	20.41	37.72	26.70	31.42	18.10	19.97
Footwear products*	34.17	62.53	45.75	54.62	32.11	34.17

Source: Calculations using ZIMRA dataset

Table 5: Descriptive statistics for Ad Valorem import tariffs (2009-14)

For example, the mean import tariffs for processing and preserving of food and fish products more than doubled from 2009 to 2010 then decreased in 2011 to 25.63 and increased again in 2012 before closing at 18.26 in 2014. Import tariffs for beverages and tobacco products increased from 27.14 in 2009 to 55.50 in 2012 then decreased from 32.10 and 27.78 in 2013 and 2014 respectively.

4. Descriptive Statistics by Spatial and Demographic Characteristics

The statistics described here serve to motivate whether there is expenditure inequality across rural and urban households as well as by gender of household headship before analyzing the import tariffs incidence. Table 6 displays the share of household expenditure on food and cloth products in a merged dataset for 2011/12 and 2013/14 household surveys; for the sake of brevity. It is evident that rural and male-headed household consume relatively higher shares of food and cloth products compared to urban and female-headed households respectively. The mean expenditure statistics also confirm that households in urban and rural areas spend more on clothes and food products respectively. This is correlated to population size, out of the 5800 households in our dataset 64 percent are rural while 81.14 percent are male-headed.

Regarding household head characteristics, statistics (not presented here) showed that there were no child-headed households as the ages ranged from 19 to 98 years and most of the heads were males. However, the share of male heads starts to decline at 45 years. There are fewer female heads with most of them aged between 56 and 60 years, their number increases with age up to 60 years where a decline starts.

Group	Food	Clothes	Population
Urban	45%	48%	36%
Rural	55%	52%	64%
Urban area mean expenditure	US$138.75	US$206.6	
Rural area mean expenditure	US$41.56	US$25.63	
Male headed households	85%	84%	81%
Female-headed households	15%	16%	19%
Proportion of female-headed household in rural			53%

Table 6: Percentage share of household expenditure on food and cloth products

These gender differences rest on male (57.4 years) versus female life expectancy (64 years) in the country [23]. Of the 19 percent female-headed household, a large proportion is divorced (34.38 percent) and widowed (26.61 percent) compared to the male-headed households. A significant proportion (53 percent) of the female-headed households resides in the rural area.

Income inequality is also evident between male- and female-headed households - Table 7 shows the distribution of these households across income brackets. While proportions of both male- and female-headed households are lower in higher than lower-income brackets there are some notable differences.

Income Brackets	Male	Female
101US$ - US$200	55.5	60.4
US$201 - US$300	15.3	14.7
US$301 - US$400	10.6	8.9
US$401 - US$500	7.7	6.5
US$501 - US$600	5.5	4.9
US$601 - US$1200	5.4	4.6

Source: Calculations using FinScope survey

Table 7: Income brackets of male and female-headed households (percent)

The percentage of female-headed households in higher (lower) income brackets is relatively lower (higher) than that of their male counterparts. This is consistent with postulation that male-headed households earn more income compared to female-headed households [28]. In light of the inequalities characterised here, the study proceeds to the benefit incidence analysis as per the study's methodology in section 2.

5. Results

In harmony with the study's objectives, benefit incidence results are discussed for the entire country, for rural versus urban households as well as for male-headed versus female-headed households.

6. Benefit Incidence Analysis – All Households

This section presents and discusses results for the incidence of import tariffs across Zimbabwean households for the period 2011 and 2013 as per equation 1.6. Table 8 shows the mean import tariffs incidence by household income deciles, scaled up by 1000 for analysis purpose since they are initially very small figures. The discussion mainly focusses on relative sizes of mean tariff incidences across households. Table 8 reveals a positive monotonic relationship between household income levels and import tariffs incidence i.e. the tariff incidence increases with household income deciles, over the years.

Decile	2011	2013
1	0.023	0.022
2	0.024	0.023*
3	0.025*	0.024*
4	0.027	0.026*
5	0.028*	0.027*
6	0.032	0.028
7	0.033*	0.029
8	0.034	0.030*
9	0.035*	0.031
10	0.036	0.032*
All deciles	0.316**	0.307**

Source: Calculations using FinScope Consumer surveys for 2011 and 2013 (* shows 10% statistical difference between one decile and the next higher decile group, ** the average for all deciles is statistically different at 5 percent for 2011 and 2013).

Table 8: Mean import tariffs incidence across decile for 2011 and 2013

We also ran statistical difference tests for the incidences between income deciles. These showed mixed results when comparing the mean import tariff incidence of one decile group to the nearest higher-ranking group. An asterisk in Table 8 denotes the statistical significant difference between the respective decile and its higher neighbour, at the 10 percent level. A cursory look at Table 8 also suggests that all households seemed to incur a relatively higher incidence in 2011 than in 2013. This is also corroborated by Lorenz curves in Figure1.The Lorenz curve of the import tariffs incidence for 2011 lies above that for 2013. This reinforces the earlier conclusion that households incurred higher import tariffs expenditure in 2011 compared to 2013. This is reassuring as the same pattern subsists in the national treasury's tariff revenue collections for the two periods [5].

To further the analysis, we now compare households' import tariffs incidence against their share of expenditure, this enables us to conclude whether the import tariffs made the households better-off or worse-off. Households are made worse-off if their cumulative share of import tariffs is greater than the cumulative share of expenditure, and better-off if vice versa [29]. The analysis can also help to determine if import tariffs are progressive or regressive.

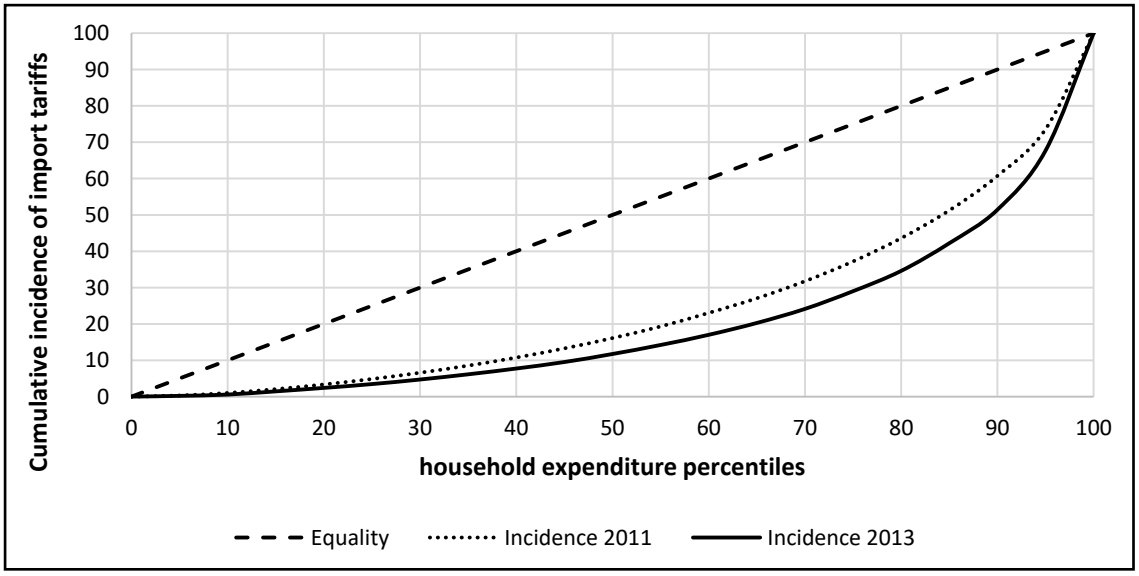


Figure 1: Comparing import tariffs incidence for 2011 and 2013
Source: Calculation using FinScope Consumer surveys for 2011 and 2013

They are regressive if the import tariff burden for the poor households is greater than non-poor households' (Daniels, 2005) [20]. Establishing this entails comparing the change in import tariff burden from 2011 to 2013 along with income groups. Figure 2 depicts Lorenz curves for household expenditure and tariffs incidence for 2011 and 2013, while Table 9 presents the actual statistics for ease of discussion.

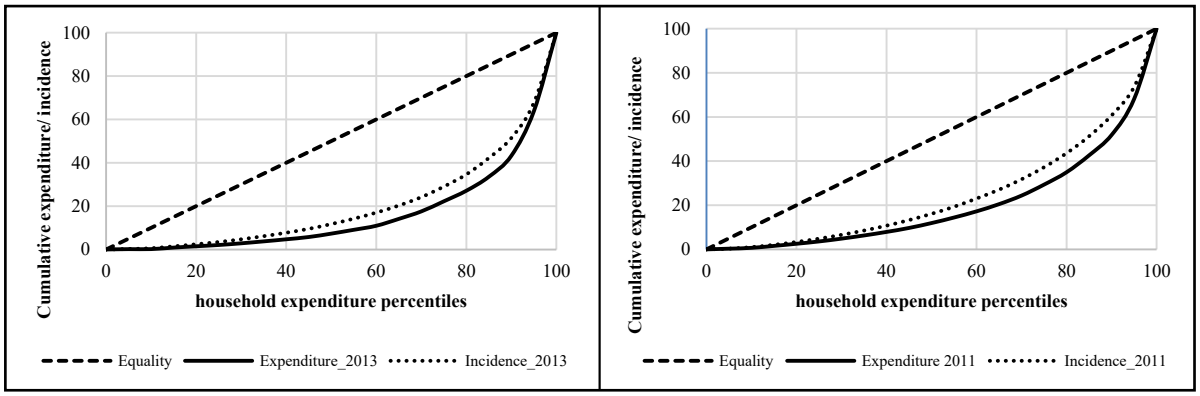


Figure 2: Incidence of import tariffs against expenditure for 2011 and 2013
Source: Calculation using FinScope Consumer surveys for 2011 and 2013.

Lorenz curves for the households' share of the import tariff burden lie above those for expenditure in 2011 and 2013. Numbers in Table 9 illuminate this pattern, apart from confirming afore-mentioned differences in 2011 and 2013 distributions for import tariffs and household expenditure.

Percentile	2011 Cumulative share of expenditure	2011 Cumulative share of import tariffs incidence	2013 Cumulative share of expenditure	2013 Cumulative share of import tariffs incidence	2011 Incidence minus expenditure (¥)	2013 Incidence minus expenditure (ϒ)	2013 (ϒ) minus 2011 (¥)
5	0.31	0.32	0.17	0.23	0.01	0.06	0.05
10	0.68	1.01	0.18	0.57	0.33	0.39	0.06
15	1.57	2.06	0.88	1.45	0.49	0.57	0.08
20	2.53	3.35	1.48	2.41	0.82	0.93	0.11
25	3.59	4.85	2.07	3.45	1.26	1.38	0.12
30	4.86	6.58	2.85	4.71	1.72	1.86	0.14

35	6.30	8.53	3.75	6.14	2.23	2.39	0.16
40	7.90	10.75	4.7	7.73	2.85	3.03	0.18
45	9.70	13.27	5.75	9.52	3.57	3.77	0.20
50	11.92	16.11	7.32	11.73	4.19	4.41	0.22
55	14.43	19.31	9.08	14.21	4.88	5.13	0.25
60	17.23	23.04	10.94	17.01	5.81	6.07	0.26
65	20.49	27.06	14.11	20.27	6.57	6.16	-0.41
70	24.37	31.76	17.57	24.14	7.39	6.57	-0.82
75	29.34	37.21	22.22	29.01	7.87	6.79	-1.08
80	34.95	43.6	27.11	34.62	8.65	7.51	-1.14
85	42.61	51.25	33.55	42.21	8.64	8.66	0.02
90	51.83	60.72	43.25	51.42	8.89	8.17	-0.72
95	68.1	73.58	63.8	67.68	5.48	3.88	-1.6
100	100	100	100	100	0	0	0

Source: Calculation using 2011 and 2013 Income and Expenditure surveys.

Table 9: Comparison of cumulative shares of total expenditure and import tariffs

Table 9 also shows a higher incidence of import tariffs in 2011 relative to 2013. For instance, in 2011, the poorest 10 percent households had an expenditure share of 0.68 percent but they suffered a 1.01 percent of the import tariffs burden. In 2013, these households had a tariff burden of 0.57 percent compared to 0.18 percent for expenditure. The same pattern is also applicable to the poorest 45 percent households, their 2011 (2013) import tariffs burden was 13.27 percent (9.52 percent) while they contributed an expenditure share of 9.70 percent (5.75 percent).

At the top of the distribution, households in the 90th percentile had a tariff incidence of 60.72 percent in 2011 and 51.42 percent for household expenditure; in 2013 these figures were 51.42 percent and 43.25 percent respectively. To check whether it is the poor or the non-poor households that incurred a relatively larger tariff burden, compared to their expenditure from 2011 to 2013, column 8 of Table 9 presents the difference between the 2013 and 2011 gaps in households' shares of tariffs and expenditure. Evidently, the poor incurred a bigger tariff burden relative to their expenditure from 2011 to 2013 while the contrary applied to the non-poor. Taken together, these findings consistently confirm that import tariffs for Zimbabwe were regressive in 2011 and 2013.

7. Benefit Incidence Analysis - Rural And Urban Areas

At the aggregate level, results show that import tariffs in Zimbabwe were general regressive. This section disaggregates the analysis to examine if there is variation in the tariff benefit incidence for rural and urban areas. This is crucial as section 2 showed that households in rural areas have lesser income and bear a larger proportion of total expenditure on food and clothes than their urban counterparts owing to their population size, among others. With these income and expenditure differences, the rural and urban households could have different extents of exposure to the import tariff burden, which warrantees further interrogation. Table 10 shows the mean import tariffs incidence of rural and urban households in 2011 and 2013.

Similar to Table 8, Table 10 shows a monotonic relationship between the incidence of import tariffs and household income decile. The poor contributed relatively low on import tariffs compared to non-poor household income groups, regardless of the time period and geographic region. This monotonic relationship between import tariffs incidence and household income level might hypothetically be due to a marginal propensity to import where those with high household income might also be importing more.

Decile	Rural Area	Urban Area	Difference between rural and urban
Panel A: 2011			
1	0.021	0.025	-0.004
2	0.024	0.027	-0.003
3	0.026	0.028	-0.002*
4	0.028	0.032	-0.004
5	0.031	0.033	-0.002
6	0.032	0.051	-0.019*
7	0.034	0.055	-0.021*
8	0.036	0.059	-0.023*
9	0.058	0.064	-0.006

10	0.069	0.072	-0.003
Panel B: 2013			
1	0.020	0.023	-0.003
2	0.021	0.026	-0.005
3	0.025	0.029	-0.004*
4	0.026	0.031	-0.005
5	0.027	0.036	-0.009*
6	0.028	0.038	-0.010*
7	0.029	0.041	-0.012*
8	0.031	0.042	-0.011*
9	0.041	0.046	-0.005
10	0.063	0.071	-0.008*

Source: Calculation using 2011 and 2013 income and expenditure surveys. (*shows 10% statistical difference between rural and urban households in the same decile)

Table 10: Comparison of mean import tariffs incidence for rural and urban households

The last column shows that urban households have high import tariff incidence compared to rural households. A negative value means a higher mean import tariffs incidence for the urban area compared to rural areas. The reason for such findings could be life-style differences between households in rural and urban areas. Rural households benefit much from subsistence agriculture which somewhat attenuates their reliance on imported products. Households in urban areas depend more on purchased food products of which most of these were imports in lieu of the Zimbabwean situation during the period of analysis.

The magnitude of the rural-urban difference in import tariff incidence is heterogeneous across deciles of household income and is significant for some deciles. One of the likely causes of such mixed findings could have been a poor rainfall season. The World Bank Climate Data Portal pointed that, for the period 2009 to 2015 Zimbabwe received a yearly average rainfall of 55 millimetres against a yearly-expected rainfall of 550 millimetres (World Bank Climate Data Portal 2018). The poor rainfall could have made both the rural and urban households depend more on imported products; explaining the erratic small differences in import tariffs incidence across income groups.

The comparison of import tariffs incidence for rural and urban areas confirms a generally higher incidence in urban relative to rural areas. In both rural and urban areas, import tariffs made households worse-off given that the import tariffs incidence curves are above the share of expenditure curves as shown in Figure 3. This compares import tariff incidence and expenditure curves for the rural and urban areas in 2011. Appendix A2 shows the corresponding curves for 2013 which exhibit the same pattern as those for 2011.

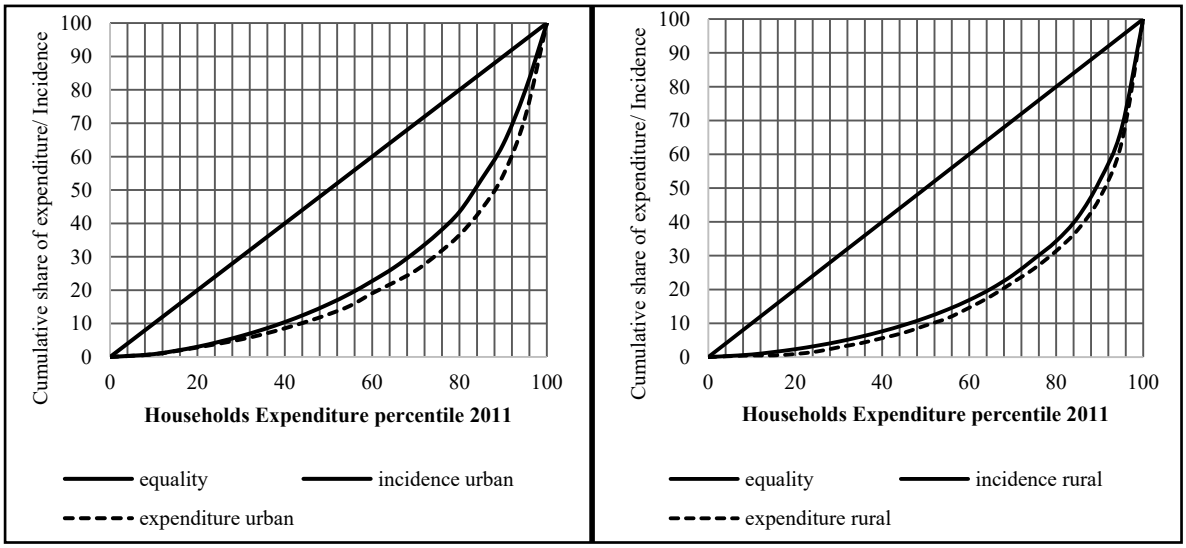


Figure 3: Incidence of import tariffs against expenditure for rural and urban areas

Source: Calculation using 2011 income expenditure survey

This means both rural and urban households are paying more in terms of import tariffs relative to their expenditure shares.

Table 11 shows the analogous import tariffs burden across the percentiles of household expenditure. The import tariff incidence is higher than the expenditure shares for both rural and urban households in 2011 and 2013. In 2011, the import tariff burden is greater for urban than rural households in 5th to 35th percentiles and the converse applies to households in 40th to 95th percentiles. For 2013, there is no obvious pattern as neither the rural nor the urban households' tariff burden persistently dominates the other in magnitude across successive percentiles of household expenditure.

Percentile	Rural tariff burden 2011	Urban tariff burden 2011	Rural tariff burden 2013	Urban tariff burden 2013	Rural (2011-2013 tariff burden difference)	Urban (2011-2013 tariff burden difference)
5	0.03	0.08	0.07	0.11	-0.04	-0.03
10	0.05	0.29	0.12	0.47	-0.07	-0.18
15	0.09	0.99	1.02	0.27	-0.93*	0.72*
20	0.19	1.43	1.34	0.72	-1.15*	0.71*
25	0.53	1.72	1.39	1.45	-0.86	0.27
30	1.01	1.68	2.05	1.97	-1.04*	-0.29*
35	1.43	1.92	1.46	1.84	-0.03	0.08
40	1.86	2.02	1.88	2.04	-0.02	-0.02
45	2.40	2.28	2.51	2.24	-0.11*	0.04
50	3.03	2.25	3.04	2.36	-0.01	-0.11
55	3.66	2.55	3.74	2.83	-0.08	-0.28*
60	3.67	2.27	3.50	3.28	0.17*	-1.01*
65	4.43	2.18	4.40	3.10	0.03	-0.92*
70	5.66	2.16	5.62	3.21	0.04	-1.05*
75	6.13	2.88	6.08	2.90	0.05	-0.02
80	6.94	2.92	6.88	3.21	0.06	-0.29
85	8.94	3.68	6.78	4.61	2.16*	-0.93
90	9.28	5.10	6.20	6.12	3.08*	-1.02*
95	7.91	4.28	4.82	5.30	3.09*	-1.02*

Source: Calculation using 2011 and 2013 income-expenditure surveys.

Table 11: Comparison of share of total expenditure and share of import tariffs

The last two columns in Table 11 show a change in the import tariff burden from 2011 to 2013. A positive value signifies a decrease in the import tariffs burden while a negative value means increased import tariffs burden from 2011 to 2013. Rural households in 5th to 55th percentiles experienced an increase in the import tariff burden while those in 60th to 95th percentiles encountered a decrease. There was a mixture of increases and decreases in the import tariff burden for urban households in 5th to 45th percentiles, while those in 50th to 95th percentiles experienced an increase in the import tariff burden. The rural area distribution of the import tariff burden shows some signs of a regressive tax system where the non-poor benefited from changes in import tariffs relative to the poor households. The urban non-poor income groups were made worse off following the import tariffs changes.

If we compare the incidence analysis in section 3.1.1 and 3.2.2, we observe that analysing import tariffs at an aggregate level veil some spatial disparities in the tariff burden. In section 3.1.1 there was a general conclusion of regressive import tariffs, while in section 3.2.2 we observe regressive import tariffs only among rural households. The non-poor urban households were clearly made worse-off while there is a mixture of benefits and setbacks among the poor urban households. In the subsequent section, the benefit incidence analysis focusses on male- versus female-headed households.

8. Benefit Incidence Analysis – Male- And Female-Headed Households

This section addresses the 3rd objective of this chapter which involves a comparison of the import tariffs incidence for male and female-headed households. These households tend to differ in terms of their income and other socio-economic characteristics, as discussed in section 2. Hence, they could be open to different extents of exposure to the import tariff burden. It is notable that this analysis is performed on a merged 2011 and 2013 dataset. This rests on the small number of female-headed households in each independent survey, for instance when we merge the 2011 and 2013 consumption surveys, the sample comprises of 580 female-headed and 2472 male-headed households. Due to prices differences between 2011 and 2013, the study used the Consumer Price Index rebasing 2013 to the 2011 price levels for a common base of analysis in the merged dataset.

Table 12 displays the import tariffs burden for male- and female-headed households, calculated as the difference between the households' mean tariff incidence and household expenditure share as presented in Table A3 in the appendix. Results show that the import tariffs burden is positive for both household types, and is surprisingly greater for female than male-headed households except for the 5th percentile. A negative value means male-headed households' import tariffs burden is less than that for female-headed households. This outcome is contrary to our apriori expectations, and to the findings for South Africa in Daniels [20]. However, it can be broadly explained by the observation that female- and male-headed households tend to differ in the way they allocate and use resources [20]. For example, female-headed or maintained households are susceptible to a relatively higher dependency burden as was found for Botswana, Malawi and Brazil [28]. Our data also shows that this holds for Zimbabwe, given that female-headed households have bigger households with 2 percent having at least 5 members living together, compared to 1.4 percent for male-headed households. This shows higher dependency in female-headed households relative to male-headed.

Percentiles	Male-headed import tariff burden	Female-headed import tariff burden	Difference between male-headed and female-headed tariff burden
5	0.04	0.01	0.03
10	0.26	0.61	-0.35
15	0.32	0.93	-0.61
20	0.54	1.40	-0.86*
25	0.88	1.84	-0.96*
30	1.35	2.20	-0.85*
35	1.76	2.25	-0.49
40	2.18	4.08	-1.90*
45	2.71	4.66	-1.95*
50	3.33	4.84	-1.51
55	3.95	6.03	-2.08*
60	4.96	7.30	-2.34*
65	4.01	6.88	-2.87*
70	4.70	7.72	-3.02*
75	4.99	8.86	-3.87*
80	5.59	7.95	-2.36*
85	5.78	10.55	-4.77*
90	5.25	10.22	-4.97*
95	3.94	8.19	-4.25*

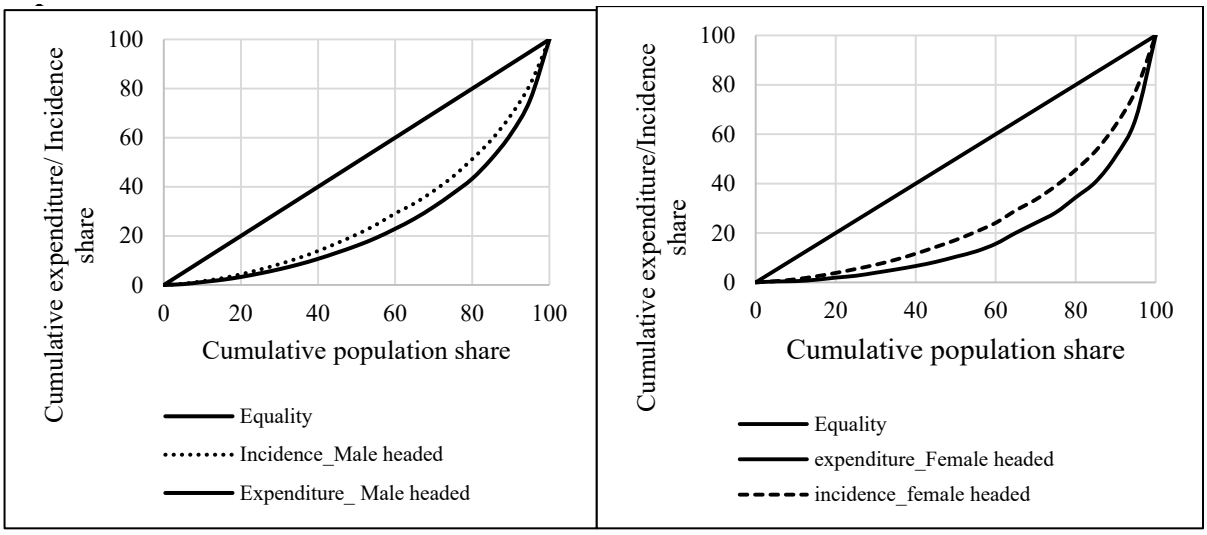
Source: Calculations after merging 2011 and 2013 consumer survey.

Table 12: Import tariffs burden for male and female-headed households

In section 2 we observed that females earn less relative to males and also that females have relatively lower expenditure share on food and clothes. This means that male-headed households could have used their income muscle to cushion themselves from future expected import tariffs change through bulk buying and stocking the affected goods. This will likely reduce the import tariff burden on male-headed households relative to female-headed households. High-income earners in female-maintained households, on average, earn less than those in male-headed households [30].

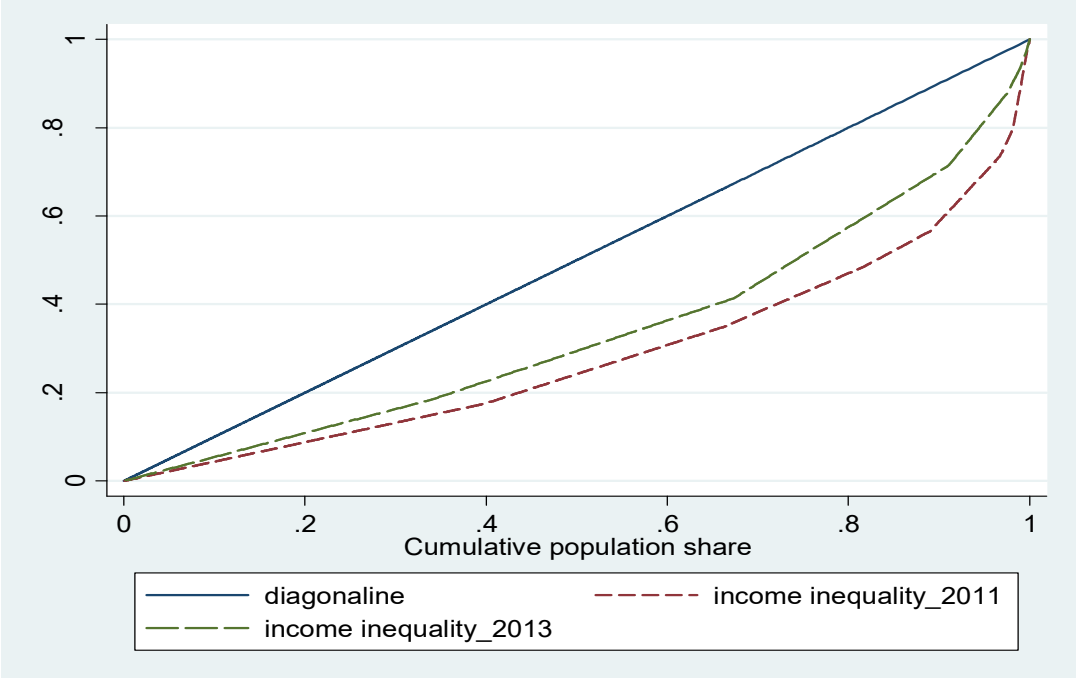
Another income shock to female-headed households emanates from their reliance on agriculture production. Our data shows that 66 percent of female-headed households get their income from farming compared to 38.8 percent for male-headed households. The adverse rain season between 2009 and 2014 might have highly increased the vulnerability of female-headed households (World Bank Climate Data Portal, 2018). The agriculture income shock might have been exacerbated by agricultural productivity differences between males and females in Zimbabwe. Female farmers are generally less productive relative to male farmers. This is highly attributed to insufficient support and experience, lack of timely inputs procurement, and relatively poor quality input usage [31,32]. The disadvantage for female-headed households could also be associated with women's relatively low literacy rates (88.7 percent versus 94.4 percent) and information networks than men; crucial for knowledge on how to cushion their families from the import tariffs effects [23].

Consistent with Table 12, Figure 4 also shows a smaller import tariffs burden for male- relative to female-headed households. We thus conclude that male-headed households incur a relatively higher import tariffs incidence but female-headed households suffer a greater import tariffs burden. Such finding points to the importance of disaggregating import tariffs analysis along gender lines.



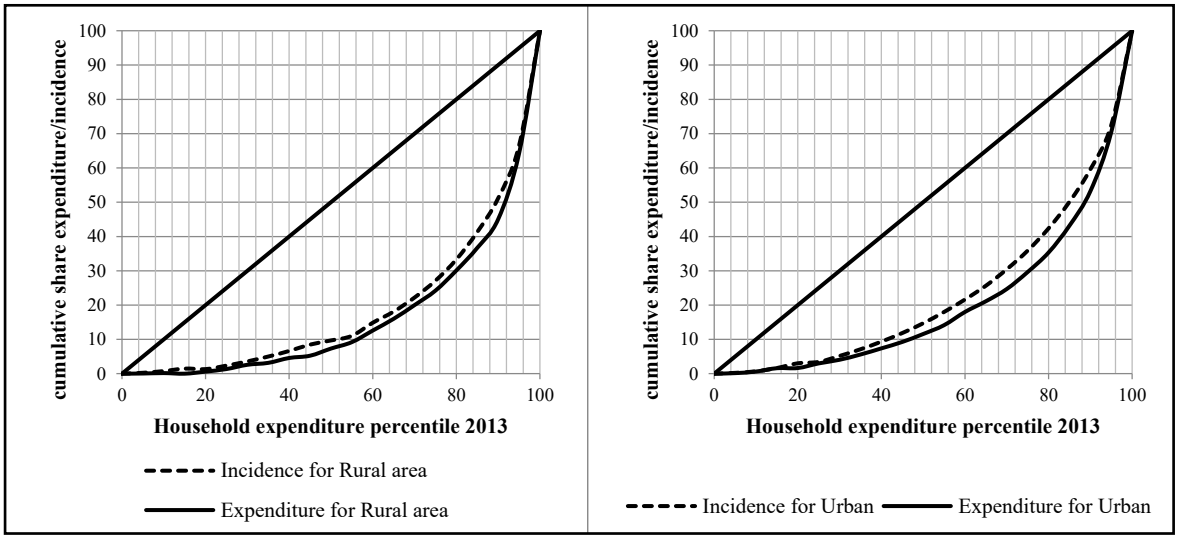
Source: Calculations using merged 2011 and 2013 consumer surveys, the data tables are shown in Appendix A3.

Figure 4: Incidence of import tariffs against expenditure for male and female-headed households



Source: Calculations using 2011/12 and 2013/14 household income and expenditure survey

A1: Comparing income inequality between 2011 and 2013



Source: Calculation using 2011 income expenditure survey

A2: Incidence of import tariffs against expenditure for rural and urban areas

Percentile	Incidence of Male-headed	Expenditure Male-headed	Incidence Female-headed	Expenditure Female-headed
5	0.51	0.47	0.37	0.36
10	1.54	1.28	1.21	0.60
15	2.76	2.44	2.10	1.17
20	4.39	3.85	3.29	1.89
25	6.34	5.46	4.77	2.93
30	8.54	7.19	6.45	4.25
35	11.01	9.25	8.41	6.16
40	13.86	11.68	10.65	6.57
45	17.11	14.40	13.24	8.58
50	20.58	17.25	15.99	11.15
55	24.51	20.56	19.15	13.12
60	29.17	24.21	22.91	15.61
65	33.25	29.24	26.99	20.11
70	38.35	33.65	31.84	24.12
75	44.18	39.19	37.32	28.46
80	51.29	45.70	43.32	35.37
85	59.18	53.40	51.44	40.89
90	69.15	63.90	61.47	51.25
95	81.71	77.77	75.41	67.22
100	100	100	100	100

Source: Calculation using 2011 and 2013 income expenditure survey.

A3: Mean import tariffs incidence for male- and female-headed households

9. Conclusion And Suggestions For Future

This study carried out a benefit incidence analysis of import tariff changes for select goods in Zimbabwe over the period 2009-2014. Results showed that Zimbabwean households incurred a higher import tariffs incidence in 2011 compared to 2013. The import tariff changes had a regressive effect amongst the households as the poor incurred a bigger import tariff burden relative to their expenditure from 2011 to 2013 while the contrary applied to the non-poor. Increasing the import tariffs burden of one group while reducing that of another makes the society worse-off depending on the relative magnitudes of the groups' import tariffs burdens [33]. also found a regressive tax system for sub-Saharan countries. However, for this study, the regressive import tariffs are partly associated with the cash budgeting

and multiple currency economic system that Zimbabwe adopted in 2009 [10]. The system prompted the government to increase taxes (import tariffs) to maximise revenue collection and fund government expenditure. For this purpose, the government focussed on frequently imported goods, which also happened to be goods mostly consumed by the poor relative to non-poor income groups.

This study also established that an aggregated analysis masks rural-urban differences in the tariff burden, and those by gender of the household head. Specifically, urban households generally incurred a higher tariff burden than rural households. However, the import tariff changes were regressive among rural households. Non-poor urban households were also made worse-off while the effect was not robust among poor urban households. The results also showed that male and female-headed households do not have a uniform import tariff burden in Zimbabwe. Female-headed households incurred a higher import tariff burden than male-headed households. We associated this result with female-headed households' relatively higher exposure to imports owing to limited means and knowledge on how to cushion themselves from scarcity of domestically produced agricultural output.

Based on the above findings, a trade policy reform is necessary to combat poverty and inequality in the country. Especially, reducing import tariffs for goods that are highly consumed by the poor, although increasing import tariffs for popularly imported goods seems attractive for increasing government revenue. However, the argument for revenue collection could be challenged if the increased revenue does not support government initiatives on poverty and inequality reduction. Instead, there ought to be a balance between revenue collection and poverty/inequality reduction.

This study maintains that the slow implementation of regional and bilateral trade agreements for the country partly explains the regressive import tariffs. Regional agreements entail reducing or eliminating import tariffs between trading partners; lack of their implementation is associated with high import tariffs. This problem applies, for instance, to the Common Market for Eastern and Southern Africa which aimed for a single market and a monetary union Mudenda, 2016 [10]. Hence, it is recommended that Zimbabwe should fully implement regional and bilateral trade agreements to partly solve the repressiveness of import tariffs.

Findings of this study also serve as lessons for countries that would consider adopting a fiscal cash budget and a multiple currency economic system. In as much as the government should raise revenue, policies must be sensitive to welfare implications on the poor. In some cases, this requires reducing import tariffs on necessary goods that are disproportionately consumed by the poor. For instance, female-headed households suffer worse welfare challenges than male-headed-households. Hence, there is a need for specific poverty and inequality policies to cushion such households from its source of livelihood's exposure to tariff changes, for instance. Government support in the form of quality inputs, provision of market information, education and mentoring of female farmers would generally go a long way in improving income generation and availing strategies for female-headed households to reduce their reliance on imports. As for the disadvantaged urban households, the creation of small business with funding and training will be helpful for improving their flow of income. Above all, improving industry capacity utilisation is crucial for reducing the country's over-reliance on imports.

This study is not without limitations. The analysis is limited to selected goods due to data issues; goods whose expenditures and tariffs could be identified in the data. Future studies can benefit from perfectly matching product lines in the import tariffs data to the expenditure in the consumer surveys, should the data be available. It is important to match all the product lines since this will improve the implicit tariff expenditure calculations, thus reducing the gap between implicit and actual expenditure incurred on import tariffs. Apart from improving the generalisability of the study's findings, the estimates will be more precise.

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