Differential Impact of Taxation on Food Items

Iffat Ara
PhD Scholar
Applied Economics Research Centre (AERC),
Karachi, Pakistan.
iara27@hotmail.com
(Corresponding Author)

Qazi Masood Ahmed
Professor
Institute of Business Administration (IBA),
Karachi, Pakistan.

Abstract: In Pakistan, essential food items are exempted from indirect taxes to avoid any subsequent increase in their prices, with the goal of protecting the poor from a regressive tax burden. Taxes on inputs such as on fuel and energy, however, are transferred to consumer prices and, due to cascading effects, can exert a burden on households. This study investigates the incidence of indirect taxes on essential and nonessential food items across households in Pakistan. To do so, we follow an input–output multiplier-based approach that allows the measurement of the cascading effect of taxes. It employs the latest available edition of the Household Integrated Economic Survey (HIES) 2018-19 in order to observe household food expenditures. Our analysis establishes that there is an effective tax even on items that are ostensibly tax-exempt, implying that households pay taxes indirectly even on those items. The incidence of these indirect taxes on essential food items is regressive across all household deciles and the incidence of indirect taxes on nonessential items is progressive at high expenditure deciles but proportional in the lower-ranking expenditure deciles.

Differential Impact of Taxation on Food Items

1. Introduction

In Pakistan, essential food items are exempted from indirect taxes to avoid subsequent increases in their prices, thus protecting the poor from an excess tax burden. However, taxes on intermediate inputs that go into the production of these items constitute implicit taxes on them. Taxes on inputs, such as on fuel and energy, are transferred to the final or consumer prices, due to the cascading effect. Ahmed and Stern (1986) have noted that commodities, even if exempted, are effectively taxed through taxes on intermediate inputs. Given this, there is a need to assess the burden of indirect taxation on food by incorporating implicit taxes, without which the burden of taxes would be underestimated.

Assessing the tax burden on the incidence of taxation across different income groups demonstrates and highlights who ultimately bears the burden of tax in society; that is, the proportion of tax paid by individuals or households in their total income.

This study investigates the incidence or – burden - of federal indirect taxes on food items across households by taking into account implicit taxes. Specifically, we examine whether the incidence of indirect taxes on food items is regressive (i.e., a greater tax burden on lower income groups), progressive (i.e., greater tax burden on higher income groups), or proportional (i.e., similar tax burden across income groups).

Determining the distributional burden or incidence of indirect taxes on food items is important for three reasons: First, the heavy reliance in Pakistan on indirect taxes; second, the higher share of food in the consumption basket of the poor; and third, the rapid rise in food prices compared to the general price level in the recent past. In Pakistan, indirect taxes constitute over 60 percent of the total federal tax revenue, and given that indirect taxes are levied on goods and services, these taxes can be shifted forward to consumers. According to the 2018-2019 edition of the Household Integrated Economic Survey (HIES), the poorest 10 percent of the households in Pakistan devote half of their expenditure on food, compared to one-third by the richest 10 percent. Average food inflation over 2004-19 had been recorded at 9.6 percent annually, compared to a lower 8.4 percent for overall inflation. Over the 2020-22 period, food

inflation has been higher at 13 percent, compared to 10 percent.[1] It is possible, looking at the numbers, to infer that food inflation compounds poverty and that taxes are a part of prices.

Recent studies by Refaqat (2008), and Jamal and Javed (2013), have estimated the incidence of indirect taxes on food groups in Pakistan. The aforementioned authors have in each case, however, *not* integrated the cascading effect of taxes on intermediate inputs. As a result, their analyses only covered those items in the food group that were taxable, and did not include items that were ostensibly tax-exempt.[2] Our study adds to the existing research in two ways: First, it estimates the incidence of indirect taxes on all food items as well as by bifurcating them into essential and nonessential items. Second, it incorporates the cascading effect of implicit taxes (taxes that are levied on intermediate inputs) while estimating incidence.

This study will cover all three major indirect taxes: general sales tax on domestic production (GST-D), general sales tax on imported goods (GST-I) and custom duty (CD) to estimate their incidence. Combined these three taxes constitute over 90 percent of the total federal indirect tax collection.[3] We employ the latest available Input–Output Table (IOT) 2010-11 to account for the cascading effect of taxes and the latest available HIES (2018-19) to observe household expenditures on food items.[4]

The remainder of the study is structured as follows: Section 2 highlights the taxation structure of Pakistan and changes that have occurred therein since 1990-91; Section 3 reviews the available research on the subject; Section 4 outlines the methodological framework; Section 5 presents the estimation results; and Section 6 concludes the paper.

2.   Pakistan's Taxation Structure

Indirect taxes have been major contributors to tax revenue in Pakistan. In 1990-91 indirect taxes constituted 82 percent of the total federal tax revenue, whereas direct taxes constituted only 18 percent, as indicated

---

[1] Figures are obtained from Government of Pakistan, Pakistan Economic Survey (various issues).

[2] Schedules of the Sales Tax Act 1990 are considered to identify taxable and exempted items.

[3] The other component is excise duty (on domestic production and imports) that constitute nearly 10% of federal indirect taxes.

[4] IOT 2010-11 is somewhat dated. However, apart from the fact that they are the latest available data sets, their use is considered reasonable since there has not been any major structural change in the composition of the economy in the last decade, except for a relative shift from manufacturing to services sectors.

in Table 1. The share of direct taxes has increased considerably since then, but indirect taxes still contribute over 60 percent of federal tax revenue.

The taxation structure of Pakistan went through significant reforms in the early 1990s. Taxation was shifted away from customs duties (CD) and federal excise duties (FED) and moved toward GST, which is a variant of value added tax (VAT). The Sales Tax Act of 1990 introduced GST at a rate of 12.5 percent on imported goods and on value added at each stage of production for goods manufactured and sold in Pakistan. Though agricultural products, petroleum, electricity, pharmaceuticals, and fertilizers were initially not covered under GST, by the late 1990s, petroleum products, electricity, and natural gas would also be included under GST. With the passage of time, the rate of GST increased to 17 percent and exemptions were removed. At present, the GST net has expanded to include food items (such as tea, sugar, beverages), essential consumer products, fertilizer, and others. The maximum tariff rate was reduced from 225 percent to 125 percent in the early 1990s and then to 30 percent in the late 2010s, and many items that were not permitted for importing were gradually made freely importable.

Table 1: Federal Tax Composition (% Share)

Tax Head	1990-91	2000-01	2010-11	2018-19	2020-21
A. Direct Taxes	**18.0**	**31.8**	**38.7**	**37.8**	**36.5**
B. Indirect Taxes	**82.0**	**68.2**	**61.3**	**62.2**	**63.5**
1. *General Sales Tax (GST)*	18.8	57.4	66.3	61.2	66.0
2. *Customs Duty (CD)*	55.8	24.3	19.3	28.8	24.8
3. *Federal Excise Duty (FED)*	25.5	18.3	14.4	10.0	9.2
Total (1+2+3)	**100**	**100**	**100**	**100.0**	**100.0**

Source: government of Pakistan, Federal Board of Revenue (FBR), Yearbook 2020-21

The composition of federal indirect tax receipts has changed considerably as a result of these reforms. In 1990-91, of the total federal indirect tax collection, CD constituted 56 percent, sales tax 19 percent and ED 25 percent. In 2000-01, GST constituted 57 percent, CD 24 percent and FED 18 percent. In 2020-21, among the three components of indirect taxes, GST dominates with a share of 66 percent, followed by CD at 25 percent and FED at 9 percent.

3. Literature Review

In general, studies have calculated that the average rate of progression to examine the incidence of taxes. Under this approach,

household survey data are utilized, with the average tax rate of each household calculated by dividing its tax liability by its total income or expenditures. The average tax rates (ATRs) are then compared across households along a welfare scale (consumption or income). The seminal work using this approach was carried out by Pechman and Okner (1974) to examine the burden of taxation in the US economy and concluded that the US tax system was generally proportional at that time. A number of later studies have also employed this approach to conduct analyses on the incidence of taxation (e.g., Musgrave et al. (1974), Browning (1978 and 1985), Wasylenko (1986), Sjoquist and Green (1992), Ruggeri et al. (1994), Kaplanoglou and Newbery (2003), Alleyne et al. (2004), and Edmiston and Bird (2004).

Recent studies that estimated the distribution of the incidence of indirect taxes in Pakistan produced mixed results. Malik and Saqib (1989) indicated a regressive system of overall indirect taxes for the year 1979, where regressivity occurred primarily due to custom duties. SPDC (2004) showed that all components of the indirect tax system were clearly regressive in 2001-02. Both studies took into account taxes on intermediate inputs using an IOT framework. Refaqat (2008) analyzed the distributional burden of indirect taxes following the tax reforms of the 1990s. The results indicated that the incidence of GST and FED changed from progressivity in the pre-reform era (1990-91) to proportionality in the post-reform era (2001-02), and CD from regressivity to progressivity. Wahid and Wallace (2008) showed the incidence of GST to be proportional in 2003-04, CD to be proportional in lower deciles and progressive in upper deciles, and FED to be regressive. Jamal and Javed (2013) indicated that GST was proportional in 2010-11; however, they showed progressivity at the upper end of the per capita expenditure deciles. Recently, Ara (2022) found that GST-Domestic presented a regressive pattern of incidence. Among various commodity groups, basic food items exhibit the highest extent of regressivity.[5,6]

The imposition of GST on domestic production and sales with (a) an expanded base and (b) an increased rate impacted its distributional burden across different segments of society. For instance, in the 1990s, when the share of GST was lowest and that of CD was highest in total indirect tax collection, their incidence was moderately progressive and

---

[5] All these studies calculated effective or average tax rates across deciles of household expenditures and assumed full forward shifting of indirect taxes.

[6] Ara (2022) estimated incidence of GST-domestic by considering the cascading effect of taxes for various commodity groups such as basic food items, personal items, durable goods, transport fuel, transport services etc.

regressive, respectively (Malik and Saqib, 1989). As the rate and coverage of GST further increased and that of CD decreased over time, their incidence changed to proportionality and to slight progressivity, respectively (Refaqat, 2008). However, analyses that had accounted for the cascading effect of input taxes concluded that the incidence of these taxes was regressive.

4. Methodology

The research adopts an input–output multiplier-based technique to estimate the incidence of indirect taxes. This technique measures the cascading effect of taxes on intermediate inputs that permeate into the final consumer price of output.

To incorporate this feature, an input-adjusted effective tax rate for each sector in the IOT is calculated based on the production coefficient matrix (Ahmed and Stern, 1991). In the (simple) input–output model of production with perfect competition and constant returns to scale, the equilibrium price equation can be written as:

$$P_s = P_b A + V \tag{1}$$

where vector P_s represents the seller's price, i.e., the price received by producers; P_b is the buyer's price, i.e., the price paid by producers for procuring intermediate inputs and by consumers on purchasing goods for final consumption; A is the fixed production coefficient matrix of IOT; and V is the vector of payments to factors of production or value added. The introduction of taxes renders the buyer's prices equation as follows:

$$P_b = P_s + T \tag{2}$$

Or

$$P_s = P_b - T \tag{3}$$

Substituting (3) into (1) gives:

$$P_b - T = P_b A + V \tag{4}$$

Or

$$P_b = T(I - A)^{-1} + V(I - A)^{-1} \tag{5}$$

This indicates that the purchaser's price is the sum of two components. The term

$$T_e = T(I - A)^{-1} \tag{6}$$

is the input adjusted or effective tax rate (ETR) vector (product of statutory tax rate and inverse of the (I-A) matrix), based on the assumption of full forward shifting of indirect taxes, i.e., the burden of indirect taxes is borne by consumers in proportion to their expenditures. This ETR is used to calculate the tax payments of households to calculate the incidence of tax. The term:

$$V_c = V(I - A)^{-1} \tag{7}$$

is the per unit resource cost vector (product of per unit value added and the inverse of the (I-A) matrix), which is the basic price vector or prices in the absence of a tax.

Computation of Effective Tax Rate

Equation (6), which calculates effective tax rates for each sector in the IOT, captures the cascading effect of taxes on intermediate inputs through the input coefficient matrix A. The variable T in equation (6) is the prevailing statutory tax rate. However, instead of using a uniform single statutory tax rate for every sector, we calculate actual tax rates for every sector based on own revenue collection. Actual rates serve to account for the tax evasion factor and, to overcome the tax compliance problem.

The revenue collected as GST-D, GST-I and CD by different heads are mapped into 81 sectors of IOTs. Then, the actual rate for each sector is calculated by dividing the amount of revenue collected by the respective sector's GDP, which is calculated by applying sectoral shares of GDP from IOT to GDP for 2018-19. ETR based on actual rates for GST-D, GST-I and CD for each sector of IOT are calculated using equation (6).

Taxes on Imports

HIES provides data only on total expenditures on each item without decomposing them into expenditures on domestic and imported items. Taxes on imports can affect household expenditures through two routes - one is the purchase of imported items for final consumption, and the other is the cascading effects of imported inputs that translates into domestic prices. To compute tax payments occurring through the first

route, actual rates must be applied to household expenditures on imported items, and for route two, ETRs must be applied to household expenditures on domestic items.

To incorporate these routes in the absence of expenditure data on imported items, a weighted average tax rate (WTR) is calculated that can be applied to total expenditures on each item. For this, the IOT is utilized, and shares of imported and domestic demand are calculated in total final demand for each sector. Mathematically, WTR for sector i is computed in the following way:

$$WTR_i = NTR_i \times SI_i + ETR_i \times SD_i$$

where *SI* is the share of imports, *SD* is the share of domestic demand in total final demand, and *i=1…81* is the IOT sector.

The steps involved in the conduct of this analysis are discussed below.

Reference unit and welfare indicator

The household is adopted as the unit of analysis on the assumption that household members tend to pool their resources and make decisions collectively regarding work, consumption, and savings (Alleyne, 2004; Refaqat, 2005, 2008; Wahid & Wallace, 2008; Jamal & Javed, 2013).

Consumption expenditures are used to measure household well-being and serve as the indicator to rank household welfare level. Consumption as a proxy to represent household welfare is defensible on the grounds that it reflects capacity to pay, is less volatile than current income, and is less likely to be underreported than income (Deaton & Grosh, 2000; Refaqat, 2005, 2008; Wahid & Wallace, 2008; Cubero & Hollar, 2010).

Tax shifting assumption

Consumers are presumed to bear the final burden of indirect taxes on the assumption that (a) owners of factors of production have perfectly inelastic supply and (b) consumers have perfectly inelastic demand for commodities. Given that reliable information on elasticities is not available, the full forward shifting of indirect taxes is generally assumed (Gemmell & Morrissey, 2003).

Computation of household tax payments

Estimation of tax incidence requires the tax payment of each household on the consumption of each food item. Therefore, food items in HIES are mapped in line with IOT sectors, and the computed ETR and WTR for each sector are assigned to each food item accordingly.

A household's GST-D payment is calculated by applying respective item's ETR, as follows:

$$TP_{j,h} = exp_{j,h} \times \frac{1}{1 + ETR_j}$$

Household GST-I and CD payments are calculated by applying the respective item's WTR as follows:

$$TP_{j,h,t} = exp_{j,h,t} \times \frac{1}{1 + WTR_{j,t}}$$

where *TP* is household tax payment; *EXP* is household expenditure; *j (=1…n)* is the food item; *h (= 1…m)* is number of households, and *t (=1, 2)*, where 1 is GST-I and 2 is CD.

Estimation of tax incidence

Estimating incidence of tax (INC) requires calculating the share of tax paid on a particular item in a household's total expenditures:

$$INC_{j,h} = \frac{TP_{j,h}}{exp_h} \times 100 \tag{11}$$

The distribution of incidence across households is examined by comparing the average incidence for each item across deciles of household expenditures. This allows for analysis regarding the progressivity or regressivity of taxes. A tax is progressive when average incidence rises while moving up the total expenditures scale; regressive when it falls with income, and proportional when it is similar across all households.

Data sources

The following data sources have been accessed:

- Household consumption expenditures: Household Integrated Economic Survey (HIES) 2018-19, Pakistan Bureau of Statistics, Government of Pakistan.

- For tracing the impact of taxes on intermediate inputs: Input–Output Table 2010-11, Federal Board of Revenue, Government of Pakistan (unpublished).

4. Results

This section provides the results of incidence. First, it displays the actual tax rates and ETRs for sectors in the IOT that are related to food items. Second, it provides the overall incidence of GST-D, GST-I and CD in rural and urban areas in Pakistan, as well as in as a whole. Third, it presents the pattern of distribution of incidence across household expenditure deciles for each component of indirect tax. Household tax payments for GST-D are calculated by using ETRs and those for GST-I and CD are calculated by using WTRs for the reasons stated in section 3. The incidence for each food group denotes the average incidence for all households. The terms pattern of incidence, distribution of incidence, and pattern of tax burden are used interchangeably.

The paper defines essential foods as wheat flour, rice, other flours, pulses, vegetables, fresh dairy, spices, ghee[7], sugar, and tea. Of these, wheat flour, rice, other flours, pulses, vegetables and fresh dairy are exempt from tax. All remaining food items, such as dry fruits, fresh fruits, meat, fish, packed dairy, eggs, butter, edible oils, bakery confectionary, beverages, canned and packed food and dining out, are defined as constituting nonessential food items. Of these, all items are taxable, except fresh fruits and eggs.

On average, the poorest 30 percent of households spend 37 percent of their expenditure on essential items, while the richest 30 percent spend 23 percent. For nonessential food items, these shares constitute 12 percent and 17 percent, respectively.

---

[7] Ghee is a kind of liquid butter, made from the cream of cows/buffaloes milk. It is used for cooking purposes in place of vegetable oil, primarily by the poor in South Asia.

There are fourteen sectors in the IOT related to the final consumption of food items. The estimated ETRs, reported in Table 2, depict the impact of taxation on domestic and imported inputs used in domestic production. All food items are effectively impacted by GST-D, GST-I and CD levied on their intermediate inputs, as reflected by higher ETRs compared to actual tax rates.

To emphasize, tax-exempted items such as rice, wheat, pulses, vegetables, fruits, livestock and post-slaughter products, milled grain and fisheries[8] are also effectively taxed at certain rates, depending upon the type, share and actual rate of tax on intermediate inputs they use. As a result, taxes on intermediate inputs are embodied in the final consumer prices.

Table 2: Actual and Estimated Effective Tax Rates – 2018-19

Sectors From IOT	GST Domestic (%)		GST Imports (%)		Custom Duty (%)	
	Actual Rate	ETRs	Actual Rate	ETRs	Actual Rate	ETRs
Rice	0.006	3.375	0.042	4.009	0.000	2.346
Wheat	0.000	3.270	0.042	3.808	0.128	2.332
Pulses	0.003	0.810	0.288	1.042	0.029	0.459
Potatoes	0.000	2.962	0.288	3.614	0.003	2.117
Vegetables & condiments	0.113	2.919	0.288	3.163	0.139	1.978
Fruits	0.025	2.395	5.196	7.809	2.345	3.880
Livestock & slaughter products	0.091	1.246	2.643	4.198	0.215	1.309
Fisheries	0.000	6.880	0.737	5.996	1.038	4.253
Vegetable oil	0.827	5.256	13.410	21.466	11.359	17.119
Milled grains	0.003	3.019	4.098	7.083	2.106	3.891
Bakery products	8.572	12.663	12.626	19.033	0.074	3.999
Sugar	8.098	10.123	12.626	14.847	0.288	1.647
Other food	17.000	19.879	14.112	17.990	14.318	16.368
Beverages	17.000	21.943	17.000	21.979	1.503	4.337

Source: Authors' estimates based of HIES-2018-19 and IOT-2010-11.
Note: ETR is always greater than zero. It can only be zero if final output as well as the inputs used to produce that output are exempted from tax or zero-rated.

The overall incidence of indirect taxes is reported in Table 3. The overall incidence of GST-D on essential food items in Pakistan is 1.16 percent, and 0.86 percent on nonessential food items. This indicates that households on average pay 1.16 percent of their expenditure as GST-D

---

[8] The major inputs of these sectors are fertilizers, pesticides, seeds, water, fuel, electricity and other crops.

when purchasing essential food items and 0.86 percent of their expenditure for nonessential food items. Likewise, the average incidence of GST-I and CD in essential food items is 1.96 percent and 1.15 percent, respectively, and that for nonessential food items is 1.23 percent and 0.72 percent, respectively. This shows that the magnitude of the incidence of each tax is higher for essential food items than for nonessential food items.[9]

Combining incidences for all three taxes gives the average incidence for essential food items at 4.3 percent and that for nonessential items at 2.8 percent. This indicates that households, on average, pay 4.3 percent of their spending as indirect taxes on essential food items and 2.8 percent on nonessential food items. The magnitude of incidence on essential items is greater as households will spend a greater proportion of their income on essential food items.

Table 3: Average Incidence (%) – 2018-19

	Commodity Groups	All Areas	Rural	Urban
GST-D	Essential Food Items	1.161	1.319	0.904
	Nonessential Food Items	0.862	0.775	1.004
GST-I	Essential Food Items	1.963	2.199	1.578
	Nonessential Food Items	1.231	1.107	1.433
CD	Essential Food Items	1.147	1.318	0.869
	Nonessential Food Items	0.715	0.631	0.853
Combined	Essential Food Items	4.271	4.836	3.351
	Nonessential Food Items	2.808	2.513	3.290

Source: Authors' estimates based of HIES-2018-19 and IOT-2010-11

The pattern of incidence for each component of indirect taxes across household expenditure deciles is as indicated in Table 4. The first decile characterizes households with the lowest total expenditures, while the tenth decile characterizes households with the highest.

Incidence on essential food items is reported separately for tax exempted and taxable items. We can observe from Table 4 that essential items that are exempted from GST-D, GST-I and CD still exert a tax burden on households due to implicit taxes, i.e., taxes on intermediate inputs used to produce these items. For each tax, the incidence or proportion of tax payments declines while moving toward the higher deciles of household

---

[9] It is to mention that the pattern of incidence of tax on any item emerges from the pattern of its consumption across households. If a taxable item constitute a greater proportion in the expenditures of households in lower deciles, its incidence generally indicates regressive pattern.

expenditures. For example, in the case of GST-D, the households in the lowest income group devote 0.58 percent of their expenditure to tax even when buying food items that are exempted from tax, while 10 percent of the households in the upper income group devote 0.38 percent. Similarly, the pattern of incidence of GST-I and CD is also regressive. This indicates that the poor bear a greater burden of implicit taxes on exempted food items.

Taxable essential food items also portray a regressive pattern of incidence for each tax, whether it is GST-D, GST-I or CD, across all deciles. For example, in the case of GST-D, average incidence indicates that households in the bottom decile or the poorest 10 percent allocate 1.05 percent of their total expenditures as tax on essential food items, while those in the top decile or the richest 10 percent allocate 0.28 percent. A similar pattern is seen in the case of GST-I and CD as well.

Nonessential food items depict a proportional pattern of incidence in some deciles and a progressive pattern in others. That is, the incidence or proportion of tax payments either remains in a close range or increases while moving toward the higher deciles of expenditures. For instance, in the case of GST-D, the average incidence is proportional at approximately 0.8 percent in the bottom six deciles (bottom 60 percent household) and gradually becomes progressive as it increases to one percent in the top decile. Similarly, the incidence of GST-I and CD on nonessential food items is progressively associated with proportionality for the bottom 40 percent of households.

Table 4: Distribution of Incidence of indirect taxes on Food Items (%) – Pakistan 2018-19

Deciles of HH expenditure	GST-Domestic (GST-D)			GST-Imports (GST-I)			Custom Duty (CD)		
	Essential Items			Essential Items			Essential Items		
	Exempted	Taxable	Nonessential Items	Exempted	Taxable	Nonessential Items	Exempted	Taxable	Nonessential Items
1	0.581	1.053	0.828	1.014	1.730	1.106	0.522	1.128	0.654
2	0.577	0.929	0.822	1.006	1.531	1.117	0.515	1.005	0.664
3	0.545	0.837	0.844	0.963	1.372	1.173	0.490	0.904	0.688
4	0.539	0.764	0.793	0.969	1.236	1.136	0.486	0.817	0.655
5	0.510	0.715	0.816	0.930	1.136	1.195	0.464	0.749	0.694
6	0.490	0.649	0.820	0.904	1.026	1.204	0.446	0.677	0.690
7	0.464	0.593	0.860	0.874	0.919	1.269	0.425	0.607	0.733
8	0.432	0.529	0.884	0.824	0.800	1.313	0.395	0.527	0.761
9	0.384	0.440	0.957	0.755	0.650	1.393	0.354	0.427	0.807
10	0.280	0.302	0.994	0.568	0.425	1.404	0.259	0.278	0.809

Source: Authors' estimates based of HIES-2018-19 and IOT-2010-11

The distribution of incidence by locale for each tax is given in Table 5. The incidence of GST-D, GST-I and CD on essential food items exhibits regressivity in rural and urban areas, with the magnitude of incidence higher in rural areas. In the case of nonessential items, the incidence of GST-D and CD is proportional across all deciles in rural areas, while it is regressive in the bottom four deciles and progressive in the remaining upper deciles in urban areas. For GST-I, proportionality in the bottom deciles is indicated, associated with slight progressivity in the upper deciles in rural and urban areas.

Table 5: Distribution of Incidence of each component of indirect tax (%) – Locale-wise 2018-19

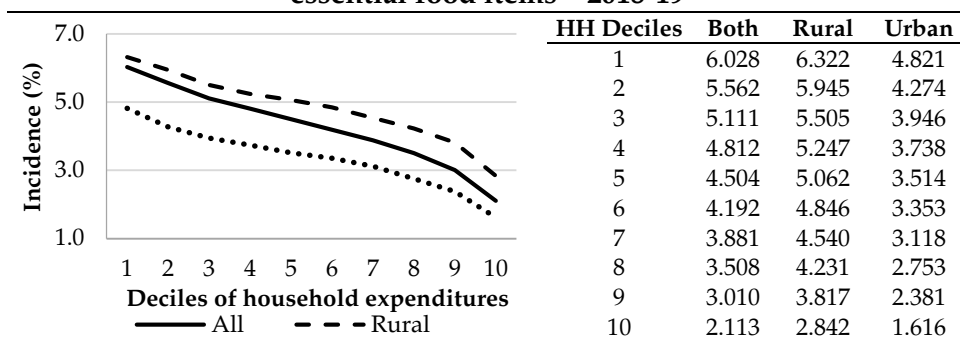| HH	GST-D				GST-I				CD			
Deciles	Essential		Nonessential		Essential		Nonessential		Essential		Nonessential	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
1	1.718	1.285	0.750	1.067	2.868	2.252	1.014	1.409	1.736	1.284	0.588	0.891
2	1.610	1.136	0.813	0.963	2.700	2.008	1.098	1.360	1.635	1.130	0.641	0.815
3	1.498	1.060	0.771	0.914	2.497	1.856	1.064	1.347	1.510	1.030	0.618	0.807
4	1.425	0.999	0.794	0.899	2.385	1.763	1.107	1.326	1.437	0.976	0.640	0.779
5	1.376	0.949	0.750	0.959	2.302	1.652	1.066	1.403	1.384	0.913	0.603	0.830
6	1.326	0.914	0.770	0.987	2.198	1.578	1.119	1.455	1.322	0.861	0.645	0.862
7	1.244	0.844	0.766	0.968	2.062	1.471	1.123	1.415	1.234	0.803	0.632	0.834
8	1.158	0.752	0.763	1.085	1.929	1.304	1.130	1.555	1.144	0.697	0.635	0.922
9	1.051	0.654	0.778	1.070	1.741	1.129	1.172	1.525	1.025	0.598	0.658	0.901
10	0.783	0.447	0.794	1.124	1.307	0.771	1.177	1.537	0.752	0.398	0.652	0.890

Source: Authors' estimates based of HIES-2018-19 and IOT-2010-11

The combined incidence of all three taxes for essential and nonessential food items for all of Pakistan and by locale is shown in Tables 6 and 7, respectively. For essential food items the combined average incidence portrays regressivity, as the poorest 10 percent of households devote 6 percent of their expenditures in taxes, while the 10 percent richest devote 2 percent (Table 6). A similar pattern is seen in rural and urban areas. However, the average incidence of essential items at each decile is higher than that in overall Pakistan in rural areas, while it is lower at each decile in urban areas.

According to Table 7, the combined incidence of all taxes on nonessential items is proportional for the bottom 60 percent of households and progressive for the top 40 percent of households. The average incidence stays at 2.5 and 2.6 percent in the bottom six deciles and then increases to 3.2 percent in the top decile. However, in the case of nonessential food items, the pattern of incidence differs in rural and urban
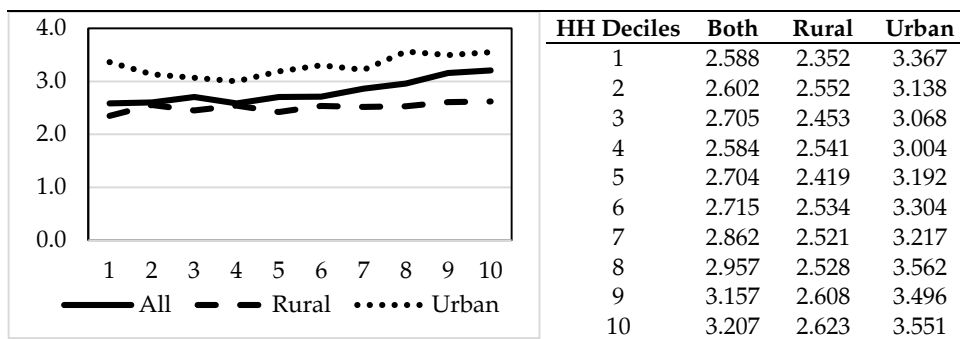
areas. The average incidence is almost proportional in rural areas, whereas it is regressive for the poorest 40 percent of households and progressive for the remaining higher income households in urban areas. A locale-wise comparison of the magnitude of the average incidence on nonessential items, with that for Pakistan as a whole, illustrates that it is higher at each decile in urban areas and lower in rural areas.

Table 6: Distribution of Incidence – combined of all three taxes for essential food items– 2018-19

HH Deciles	Both	Rural	Urban
1	6.028	6.322	4.821
2	5.562	5.945	4.274
3	5.111	5.505	3.946
4	4.812	5.247	3.738
5	4.504	5.062	3.514
6	4.192	4.846	3.353
7	3.881	4.540	3.118
8	3.508	4.231	2.753
9	3.010	3.817	2.381
10	2.113	2.842	1.616

Source: Authors' estimates based of HIES-2018-19 and IOT-2010-11

Table 7: Distribution of Incidence – combined of all three taxes for nonessential food items– 2018-19

HH Deciles	Both	Rural	Urban
1	2.588	2.352	3.367
2	2.602	2.552	3.138
3	2.705	2.453	3.068
4	2.584	2.541	3.004
5	2.704	2.419	3.192
6	2.715	2.534	3.304
7	2.862	2.521	3.217
8	2.957	2.528	3.562
9	3.157	2.608	3.496
10	3.207	2.623	3.551

Source: Authors' estimates based of HIES-2018-19 and IOT-2010-11

The literature cites cases from countries where direct welfare payments have compensated households/families for the burden of tax liability (see Crisan et al., 2015; and Ruggeri et al., 1994). Pakistan itself has a fairly large program of direct unconditional cash transfers., i.e., the Benazir Income Support Programme (BISP). Currently, BISP transfers funds to women in 9 million families at the rate of Rs. 2,300 per month per family, amounting to Rs. 27,600 per year.

Pakistan's population, as per the 2017 Census, comprises 32 million households. As such, BISP caters to families in approximately 28 percent of households or in the bottom three deciles. These families pay an average of Rs. 8,728 in taxes on essential food items, where Rs. 3,277 are implicit taxes that constitute approximately 16 percent of the expenditure on essential food (see Table 8). This leaves net (BISP) receipts amounting to Rs. 18,872 per year.

It needs to be qualified that the above stated amount of taxes, including implicit taxes paid, is only for certain essential food items, whereas all households pay implicit taxes on all other items. Moreover, not all families in the bottom three deciles receive BISP payments. This is because the modality of beneficiary identification is based on a survey of households. The survey collects household-level data on asset ownership by type (formal or informal housing, type of vehicle owned, if any, etc.) and assigns scores to determine poverty.

Table 8: Average yearly expenditures and tax liabilities on essential food items by deciles of household 2018-19 (in Rupees)

Deciles of household expenditures	Expenditures on essential food	Taxes liabilities on essential food	of which implicit taxes	Taxes as % of Expenditures	No. of households (million)
1	40,740	6,725	2,379	16.5	3.2
2	57,171	9,151	3,437	16.0	3.2
3	65,653	10,308	4,013	15.7	3.2
4	74,974	11,380	4,698	15.2	3.2
5	82,187	12,311	5,189	15.0	3.2
6	90,670	13,241	5,797	14.6	3.2
7	100,618	14,318	6,494	14.2	3.2
8	112,235	15,476	7,285	13.8	3.2
9	127,042	16,845	8,360	13.3	3.2
10	153,754	19,147	10,145	12.5	3.2
Average of bottom 3 deciles	54,521	8,728	3,277	16.1	-

Needless to say, the survey overlooks and omits several families that fall below the poverty line, particularly in areas where ground transport networks are poor (e.g., in Balochistan, the former FATA region of Khyber-Pakhtunkhwa, Tharparkar in Sindh, and Gilgit-Baltistan). The homeless among the absolute poorest of the poor also end up being excluded as they do not have a permanent or fixed address, and are unable to obtain the Computerized National Identity Card (CNIC), which is the basis of being included in the BISP roster.

6.   Conclusion

This study examines the pattern of incidence of three major components of indirect taxes – GST-D, GST-I and CD – for essential and nonessential food items for 2018-19. While examining said patterns of incidence, the paper takes into account the implicit taxes, i.e., taxes levied on intermediate inputs using the Input Output Table.

We establish that there is an effective tax even on items that are exempted from tax. This emerges due to implicit taxes on these items, which is tax on intermediate inputs used to produce these items. Hence, households pay taxes even on items that are ostensibly exempted from tax. The results of incidence analysis show that the overall combined incidence of three major components of indirect taxes on essential items is 4.3 percent and on nonessential items is 2.8 percent. The pattern of incidence of each tax is regressive across all household deciles on essential food items that cover a large share of the expenditures of poor households. However, food items that are nonessential and encompass relatively larger shares in the expenditures of the rich segment portray a proportional pattern for the bottom 40 percent household and a progressive pattern for the top 60 percent.

As the poor spend a greater proportion of their expenditure on food, particularly on foodstuffs deemed essential, any increase in prices due to taxes on inputs, particularly fuel and energy, places a greater burden on the poor than on the rich. This increases their food budget and leaves less space to spend on other basic needs, such as health and education. However, exempting essential items as well as their inputs from taxation would not only result in revenue losses but would also benefit upper income households that can afford to bear the burden of taxes.

This problem of secondary distortions has been recognized in the literature and in policy actions. To avoid such consequences, transfer payment programs have been introduced that provide support to the poor for fulfilling their essential needs. Practices from other countries demonstrate that regressivity in the tax structure at the lower end of the income scale can be neutralized via transfer payments. The transfer payments program in Pakistan, such as BISP, compensates recipient households roughly in the bottom three deciles though the coverage of the program is not perfect which means that many lower income households are not compensated.

References

Ahmad, Etisham and Nicholas Stern (1986). Tax Reform in Pakistan Overview and Effective Tax Rates for 1975-76, *Pakistan Development Review*, 25 (1).

Ahmad, Etisham and Nicholas Stern (1991). *The Theory and Practice of Tax Reform in Developing Countries*. Cambridge University Press.

Alleyne, Dillon; James Alm; Roy Bahl and Sally Wallace (2004). *Tax Burden in Jamaica*. *Working Paper* 04-34, Andrew Young School of Policy Studies, Georgia State University.

Ara, Iffat and M. Asad Khan (2022). Estimating the Distributional Burden of General Sales Tax in Pakistan, *unpublished paper*, 2nd Research for Social Transformation and Advancement (RASTA) Conference, Pakistan Institute of Development Economics (PIDE), (https://pide.org.pk/rasta/wp-content/uploads/Public-Finance-Management_Iffat-Ara_WP.pdf).

Browning, Edgar K. (1978). The Burden of Taxation. *Journal of Political Economy*, 86: 649-671.

Browning, Edgar K. (1985). Tax Incidence, Indirect Taxes, and Transfers. *National Tax Journal*, 38 (4).

Chen, D., Matovu, J.M. and Reinikka, R. (2001). A Quest for Revenue and Tax Incidence in Uganda. *IMF Working Paper* WP/01/24, Washington DC.

Crisan, Daria, Kenneth J. McKenzie, and Jack M. Mintz (2015). The Distribution of Income and Taxes/Transfers in Canada: A Cohort Analysis. *Research Paper*, 8 (5), the School of Public Policy, University of Calgary.

Cubero, Rodrigo, and Ivanna Vladkova Hollar (2010). Equity and fiscal policy: The income distribution effects of taxation and social spending in Central America. *Working Paper* No. WP/10/112, International Monetary Fund (IMF), Washington, D.C.

Deaton, Angus and Grosh, M. (2000). Consumption. In M. Grosh and P. Glewwe (Ed.), *Designing Household Questionnaires for Developing*

Countries: Lessons from Fifteen Years of the Living Standard Measurement Study, The World Bank, Washington DC.

Edmiston, K. D. & Bird, R. M. (2004). Taxing Consumption in Jamaica: The GCT and the SCT. *Working Paper 7*, Jamaican Tax Reform Project, Andrew Young School of Policy Studies, Georgia State University.

Gemmell, Norman; Morrissey, Oliver (2003). Tax structure and the incidence on the poor in developing countries. *Research Paper*, No. 03/18, Centre for Research in Economic Development and International Trade (CREDIT), the University of Nottingham.

Jamal, Haroon and Sohail Javed (2013). Incidence of General Sales Tax in Pakistan: Latest Estimates. *Pakistan Journal of Applied Economics*, Vol. 23, No. 2.

Kaplanoglou, G., and David M. Newbery (2003). *The Distributional Impact of the Proposed Tax Reform on Greek Households*. Centre of Planning and Economic Research, Athens.

Malik, M. H., and Najam-us-Saqib (1989). Tax Incidence by Income Classes in Pakistan. *The Pakistan Development Review*, Vol.28, No. 1.

Pechman, J.A. and Benjamin Okner (1974). *Who Bears the Tax Burden?* Brooking Institute, Washington D.C.

Refaqat, Saadia (2005). Redistributive Impact of GST Tax Reform: Pakistan, 1990–2001. *The Pakistan Development Review*, 44, No.4 (Part II).

Refaqat, Saadia (2008). *Social incidence of indirect taxation in Pakistan - (1990 – 2001).* Thesis submitted for the degree of Doctor of Philosophy, University of Bath, UK.

Rajemison, Harivelo; Steven Haggblade and Stephen D. Younger (2003). Indirect Tax Incidence in Madagascar: Updated Estimates Using the Input–Output Table. Working Paper 147, Cornell Food and Nutrition Policy Program, Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=452120

Ruggeri, G.C., D. Van Wart, and R. Howard (1994). The Redistributional Impact of Taxation in Canada, Canadian Tax Journal, 42 (2).

Sjoquist, D.L. & Green, D. (1992). Distribution of Tax Burdens. Policy Research Center. College of Business Administration, Georgia State University, Jamaica Tax Review Project, Report No.3.

SPDC (2004). *Combating Poverty: Is Growth Sufficient?* Annual Review of Social Development in Pakistan. Social Policy and Development Centre, Karachi.

Wahid, Umar and Sally Wallace (2008). Incidence of Taxes in Pakistan: Primer and Estimates. *Working Paper* 08-13, International Studies Program, Andrew Young School of Policy Studies.

Wasylenko, M. (1986). The Distribution of Tax Burden in Jamaica: Pre-1985 Reform. *Staff Paper* No.30, Jamaica Tax Structure Examination Project, Syracuse University and Board of Revenue, Government of Jamaica.