

## **Redistributive Impact of GST Tax Reform: Pakistan, 1990–2001**

SAADIA REFAQAT

### **I. INTRODUCTION**

Pakistan has undergone a significant change in tax structure over the last fifteen years. However, this change is not apparent on the surface, as there has not been much change in the tax to GDP ratio over the last fifteen years. But if we look beyond the surface we can see changes, for example in (1990-91), indirect taxes contributed 82 percent of total tax revenue with Customs, Excise and Sales tax each contributing around 55, 28 and 18 percent respectively, while in (2001-02), indirect tax share within the total tax revenue fell slightly to 68 percent with Customs, Excises and Sales tax each now contributing around 18, 18 and 64 percent respectively.

Thus, it may not be wrong to say that there has been a significant change in the tax mix in the span of less than ten years and this development is important from the perspective of efficiency, effectiveness and equity with which revenues have and will be raised. Although, Value Added Tax (VAT) is likely to be more efficient in raising revenue than both the ordinary Sales Tax and Trade Taxes that it has replaced see e.g. [Nellor (1987); Liam Ebrill (2001)], the same cannot be said as far as the fairness issue is concerned. This in no way implies that the trade taxes replaced by VAT were more fair. However in most developing countries they operate with strict import licensing schemes, binding quotas and foreign exchange restrictions that make them more a kin to lump sum tax. Therefore in most cases they have no flow through effect to the consumers [for example see Clarete (1986); Shah (1991)]. But in contrast to this VAT being a consumption tax has the capacity to directly affect each and every household. Thus equity becomes much more of a real concern and this concern is heightened given that governments of most of the developing countries lack the capacity to carry out significant redistribution.

Saadia Refaqt is a PhD candidate at the Department of Economics and International Development, University of Bath, UK.

This paper will begin with a brief introduction of Value Added Tax (VAT). Section II describes and compares major incidence methodologies as well as explains the methodology used in this study. Section III presents (1) estimates the incidence of VAT at national, provincial and regional level and a comparison of progressivity of VAT to the progressivity of sales tax it replaced, (2) an examination of VAT (2001-02) at individual commodity level is carried out to better comprehend VAT incidence on the poor, (3) distributional characteristics of goods to rank good and services consumed by the poor in order to propose pro-poor VAT reforms.

### **Description of VAT**

Historically, Sales Tax in Indo-Pakistan used to be a provincial tax in accordance with the provisions of the Government of India Act, 1935. After Pakistan's independence, the Sales Tax Act of 1948 replaced the Government of India Act of 1935. In 1952, Sales Tax was permanently transferred to the federal list of subjects.

In November 1990, the General Sales Tax Act of 1990 came in force. This act prescribed a VAT type system in which the value added component at each stage was taxed. Initially, this tax was restricted to import and local manufacturing stages (only in the case of nine items was Sales Tax extended to the wholesale/distribution stage for the locally manufactured goods). General exemptions were extended to sugar, cottage industry, medicines, leather and sports goods, machinery and basic food. All of this lead to a very narrow coverage of Sales tax and not much was generated in terms of revenues. However, in 1995 further changes were introduced in the General Sales Tax of 1990 to bring it closer to the true spirit of VAT. The scope of coverage of the tax was extended to importers, local manufacturing as well as the retail level and a large number of existing exemptions were eliminated. Despite these positive developments, one major policy handicap still remains. Under the constitution of Pakistan taxation of goods is a federal subject whereas taxing services is a provincial matter.

## **II. METHODOLOGY FOR ANALYSING TAX INCIDENCE**

### **Incidence Methodologies and Assumptions: A Brief Note**

There is no one approach to the study of tax incidence, all approaches have their advantages and disadvantages and the approach used ultimately depends on the end result required. However, the tax incidence approaches can be divided into two broad categories i.e. conventional approach and general equilibrium approach.

The basic methodology behind conventional models of tax incidence is to allocate tax burdens to different groups while arranging households on the basis of consumption or income. Tax burdens are allocated based on average tax rates and

distributed by making explicit assumption as to who is likely to bear them, (see for example, [Musgrave (1959); Bird (1973); Musgrave (1974); Pechman (1974); Gillespie (1980)] to name a few and quite recently, [OECD (2000); Chen (2001); Kaplanoglou (2003); Refaat (2003); Kaplanoglou (2004)]. All have used the conventional methodology. However, many of the recent studies, instead of using average tax rates and explicit assumptions, are determining tax burden for each household on the basis of its expenditure and income patterns. In addition to this, some studies have also used an input-output framework to take into account of taxation of intermediate goods and exemptions e.g. see [Bird (1973); Ahmad (1989); Bahl (1991); Munoz (2003); SPDC (2004)].

The other main approach to the measurement of tax incidence is the General Equilibrium (GE) approach pioneered by [Harberger (1962)]. The main idea behind this approach is to study incidence within the GE model of the economy, where incidence is established by comparison between before and after tax change in the vector of equilibrium prices [see e.g. Mieszkowski (1969); McLure (1975); Bovenberg (1987)]. More recently, numerical and computable general equilibrium models have been developed which are solved using data from national accounts, household expenditure survey and taxpayers from the Ministry of Finance [see e.g. Fullerton (1978); Haveman (1979); Deverajan (1980); Ballard 1985)].

This brings out the question of which approach is better? The positive point of the conventional method is that it is transparent, relatively simple and the implication of alternative assumptions can be easily compared. On the minus side as [Deverajan (1980) pointed out], it ignores the effect on factor prices as well as the second round effect on prices of commodities. A general equilibrium approach on the other hand has the advantage of using an explicit structure model of the economy, it allows interaction of various taxes and can be used to measure excess burden. On the minus side, this approach is operationally intensive and it can take many iterations to find a GE vector of prices. Thus, in nutshell if the purpose of the study is only confined to measure the distributional burden of taxes, the conventional approach is adequate; while the CGE approach is best suited to identify excess burden of taxation. It must be kept in mind that it is not necessary that the basic result of the two approaches may differ hugely. Deverajan, *et al.* (1980) reported not much difference in the results while comparing the result of tax incidence from the conventional approach and from that using the Harberger-type model.<sup>1</sup>

This brings into light another important issue i.e. whether taxes levied on commodities are completely shifted into their prices or whether the incidence falls on firms as well? Although most conventional studies of distributional burden have relied on a full 100 percent shifting assumption e.g. see [Samuel (1919);

<sup>1</sup>This section heavily relies on: Martinez-Vazquez (2001). The Impact of Budgets on the Poor: Tax and Benefit Incidence, International Studies Programme, Andrew Young School of Policy Studies, Georgia State University.

Provopoulos (1979); OECD (1981); Sahn (1996); Younger (1999); OECD (2000)] etc. and we also make this assumption, it needs to be remembered that a 100 percent tax shifting assumption is not necessarily an extreme case. Quite recently, [Besley (1998)] found the full forward shifting hypothesis to be a lower bound of redistributive effect of the (proposed) VAT tax on prices in USA. They looked at price data on certain commodities for several cities between (1982-1990). Their result showed that for some commodities the prices increased by the exact proportion of taxes while for other the increase was even more than 100 percent! Thus, signifying a 100 percent shifting assumption could well be a lower bound rather than the upper most extreme as commonly perceived.

There is a small literature on tax incidence in Pakistan. For example, for studies on intersectoral tax burden in Pakistan see [Hamid (1970); Chaudhry (1973); Jeetun (1978); Kazi (1984); Malik (1985)] and for overall incidence see [Jeetun (1978); Malik (1989)] for seventies and eighties and see [Refaqt (2003); SPDC (2004)] for tax incidence analysis for recent years. All of these studies have used the conventional incidence methodology and 100 percent tax shifting assumption.

### **Our Approach**

This paper will use [Pakistan (1990-91); Pakistan (2001-02)] Household Integrated Economic Survey which is collected by the Federal Bureau of Statistics, Pakistan to analyse the incidence of VAT. The (1990-91) HIES survey consists of 6,393 households while the (2001-02) survey data contains 14,704 households. The datasets report on basic demographic characteristics as well as household expenditure patterns. The domestic expenditure items that we have included follow Deaton (2002) and include:

- food and beverages;
- cigarettes and tobacco;
- clothing and footwear;
- housing, water, electricity, gas and other fuels;
- furnishing, household articles and operation;
- health;
- education;
- transport and communication;
- personal care and effects;
- miscellaneous goods and services;
- household durable goods (10 percent value).<sup>2</sup>

<sup>2</sup>We include household durable goods because they are important from the tax perspective. However, in order to avoid complicated depreciation problem we followed [Johnson, *et al.* (1989)], [Younger, *et al.* (1999) and Zaidi (2002)] whereby including only 10 percent value of stock of durable goods thus making an implicit assumption that a household durable item bought any year will last only for ten years.

Not included:

- levy, fines and taxes;
- hospitalisation charges and medical fees;
- birth, marriage and religious ceremonies expenditure.

Although for our incidence analysis we use the conventional approach, we do not use the distribution of tax burden *vis-à-vis* average tax rates. On the contrary, we calculate taxable liability for each and every household based on its given expenditure pattern by identifying each taxable item and aggregate this and then multiply respective household aggregate taxable expenditures to the prescribed GST/VAT rate to get household respective tax liabilities. In order to arrive at an effective tax rate, we divide household respective GST or VAT liabilities by (net) paid expenditures. We believe this is a better approach than average distribution of tax liabilities since each household burden is calculated in line with its representative expenditure pattern.

In order to carry out within survey incidence comparison at national, provincial and regional levels we adjust both surveys using a Paasche Index. In addition to this in order to carry out across survey comparison, we inflate (1990-91) expenditure aggregates to (2001-02) using the GDP deflator ratio.

### III. TAX INCIDENCE ANALYSIS OF VAT

#### (1) GST (1990-91) and VAT (2001-02): A Comparison over a Decade

Table 1 presents the GST incidence result for (1990-91) and (2001-02). We can see that the average national GST incidence for (2001-02) is 7.89 percent compared with 2.02 percent for (1990-91) thus registering an increase of over 586 percent over the period. Looking at the GST schedule for 90-1 (01-2) we find that the average tax incidence (see Table 1) for the poorest and richest ten percent population of Pakistan was at 1.66 percent (7.89 percent) and 2.02 percent (7.85 percent) respectively.

Figure 1 presents the incidence of GST and VAT for (1990-91) and (2001-02) at national level respectively. If we look at the GST incidence for (1990-91) an interesting feature is that it appears to be clearly progressive except for the population in the seventh decile. But if we look at the VAT incidence for (2001-02) we see a appearance of an inverted U-shaped curve, where incidence at the bottom 20 percent appears to be very high and this increases further for the middle classes but comes down for the richest segments of the population. Thus, perhaps suggesting that after reform a higher proportionate GST tax burden is borne by the poor and the middle classes compared to the richer segment of the population.

Table 1

*Incidence of GST in Pakistan (1990-91) and (2001-02) in Percentage*

Deciles	Pakistan		Urban		Rural		Punjab		Sindh		NWFP		Balochistan	
	(1990-91)	(2001-02)	(1990-91)	(2001-02)	(1990-91)	(2001-02)	(1990-91)	(2001-02)	(1990-91)	(2001-02)	(1990-91)	(2001-02)	(1990-91)	(2001-02)
1.00	1.66	7.89	1.23	5.51	1.57	7.41	1.61	7.40	1.69	6.69	1.08	6.16	1.42	5.79
2.00	1.89	7.91	1.42	5.52	1.89	7.43	1.89	7.48	1.81	6.34	1.31	6.45	1.55	5.91
3.00	1.96	7.84	1.44	5.52	1.85	7.39	1.94	7.54	1.95	6.24	1.52	6.54	1.53	5.92
4.00	2.01	7.93	1.53	5.62	2.00	7.54	1.91	7.60	1.83	6.33	1.80	6.48	1.51	5.82
5.00	2.02	7.95	1.57	5.62	2.03	7.50	2.05	7.71	1.78	6.24	1.80	6.45	1.71	5.96
6.00	2.01	8.00	1.63	5.59	1.97	7.65	1.95	7.54	1.82	6.04	1.71	6.59	1.71	6.03
7.00	2.11	7.90	1.66	5.49	2.01	7.55	2.01	7.63	1.88	5.98	1.78	6.48	1.69	6.04
8.00	2.16	7.85	1.69	5.73	2.13	7.58	2.17	7.55	2.01	5.91	1.76	6.31	1.75	6.32
9.00	2.25	7.81	1.69	5.85	2.25	7.62	2.22	7.64	2.00	5.99	1.75	6.34	1.66	6.47
10.00	2.30	7.85	1.85	5.82	2.37	7.79	2.22	7.72	2.07	5.84	1.89	6.25	1.71	6.61
<b>Avg.</b>	<b>2.02</b>	<b>7.89</b>	<b>1.57</b>	<b>5.63</b>	<b>2.00</b>	<b>7.54</b>	<b>1.99</b>	<b>7.57</b>	<b>1.88</b>	<b>6.15</b>	<b>1.60</b>	<b>6.41</b>	<b>1.62</b>	<b>6.08</b>

\*Total number of households in (2001-02) is 14,638.

\* HIES 1990-91 contains 6,376 households.

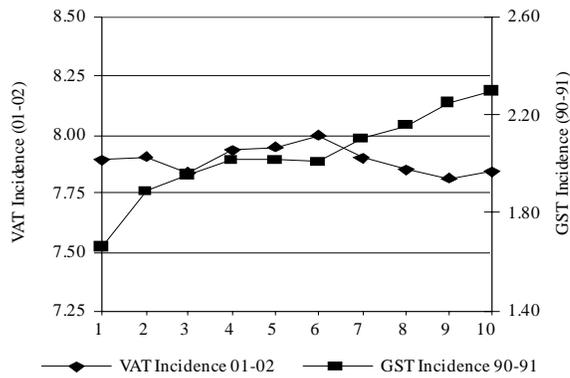
\*\* All figures have been adjusted using Paasche Index.

\*\* Data has been weighted.

\* Population deciles are based on 10 percent of population.

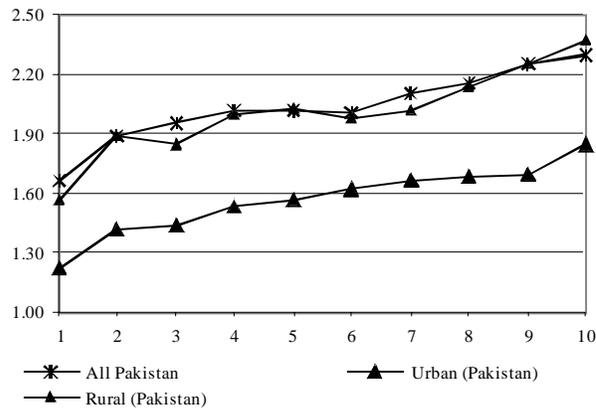
\* 2001-02 VAT rate is 15 percent while for 90-91 VAT rate is 12.5 percent.

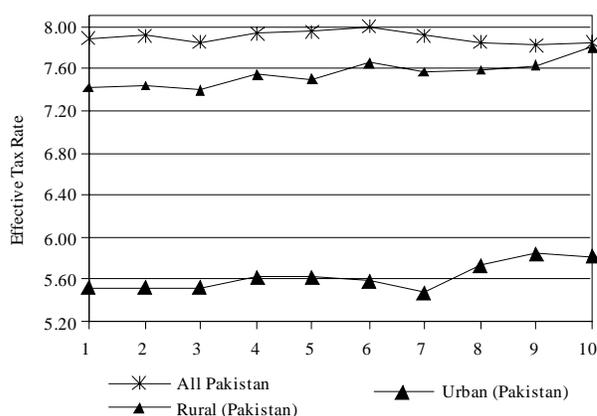
**Fig. 1. GST and VAT Incidence (%)**



It is also quite interesting to compare changes in expenditure per capita (pc) and tax liabilities together over (1990-91 to 2001-02). Our results show that during this period, average Pakistani household (pc) expenditure fell by 5 percent while their tax liabilities due to GST reform increased by 2.9 percent points. Similarly, average poorest and richest ten percent household (pc) expenditure declined by 13 percent and 17 percent respectively while their tax liabilities on the other hand increased by 3.74 and 2.41 percent point respectively, thus poor households appeared to be facing a much higher increase in tax incidence coupled with declining expenditures.

**Fig. 1a. GST Incidence in (%): Pakistan and Regional (1990-91)**



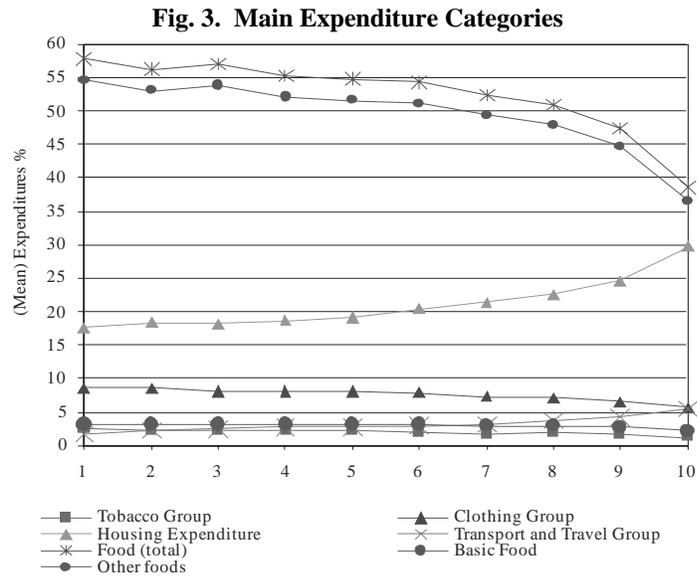
**Fig. 2. GST Incidence in (%): Pakistan and Regional (2001-02)**

What has also been striking in this story is the disparity in the intersectoral tax burden over the years. Although both in (1990-91) and (2001-02) rural GST incidence appears to be higher than the urban incidence but in (2001-02) after reform rural incidence appeared to be much higher and sharply different from GST urban incidence. Thus, it appears that the reforms have not really helped in terms of bringing urban and rural incidence more closer compared to before, in fact it has heightened this inter-sectoral disparity in incidence. Figuratively speaking, poorest ten percent consumption in (2001-02) as a proportion of (1990-91), declined by 11 percent and 12 percent for the rural and urban poor respectively while during the same time, their tax liabilities have increased by 3.72 and 3.50 percent points. However, if we look at the richest ten percent population, their proportionate consumption over time, at least for the urban richest did not decline at all while for the rural richest it declined by 24 percent, where as their tax liabilities on the other side have increased by 2.14 and 2.29 percent points respectively. Thus, it appears that on one side, not only the consumption expenditure over time for the regional poor were falling behind the regional richest but on the other hand they ended up facing comparatively similar level of increases in tax liabilities.

## (2) Examination of VAT (2001-02) at Individual Commodity Level

This section will focus on individual items of GST taxation to figure out where the high incidence of GST in (2001-02) is coming from particularly from the point of view of the poor. Although, progressivity or regressivity of individual items does not matter for tax incidence (what matters is the collective tax incidence), looking at individual items will enable us to better understand the tax incidence. But first we will look at what the households are spending on.

Figure 3 presents the main household expenditures for various categories of expenditure across different segments of population. These categories include food (basic and other food items), housing (rent and maintenance, fuels, utilities, household durables and crockery), transportation and travel (public transport, car, motorcycle, air-travel and petrol/diesel charges), tobacco and chewing products and clothing expenditures.



Not surprisingly, the highest share of the poorest households expenditure is going to food items where they are spending 58 percent compared to 39 percent being spent by the richest ten percent. If we look at the overall food expenditure category we can see that it follows Engle's Law i.e. the expenditure on food declines as household becomes more affluent. If we disaggregate food into two categories i.e. basic food (milk, vegetables, fruits, spices, lentils, oils and sugar etc.) and other food items (biscuits, tea, eating out etc.) we find that in the case of basic food items expenditure, poorest ten percent are spending 55 percent on basic food items compared to 37 percent being spent by the richest ten percent households. On the other hand, if we look at the other food category, we see that poorest ten percent are spending 3.3 percent on this type of expenditure compared with 2.2 percent being spent by the richest ten percent. The other important expenditure category for the poor is housing expenditure (18 percent), followed by clothing expenditure (9 percent), tobacco and chewing group expenditure (2.4 percent) and transport and travel group expenditure (1.8 percent). While for the richest ten percent households

the most important expenditure category is also food (39 percent), followed by housing expenditure (30 percent), transport and travel group (5.5 percent), clothing expenditure (5.6 percent) and tobacco and chewing expenditures (1.2 percent). Thus, it appears as households become more affluent their food expenditure fall quite sharply, where as their housing and transport and travel expenditure increase quite significantly.

Now we turn to the incidence emerging from these main expenditure categories, results of which are reported in Table 2 and Figure 4. Surprisingly, the highest incidence of GST for the poorest household is coming from basic food 2.60 percent (of which 51 percent of incidence is coming vegetable ghee consumption, 41 percent of incidence is coming from sugar, 0.38 percent from cooking oils and 0.26 percent from other oils). This is followed by clothing expenditure at 1.55 percent, housing expenditure at 1.05 percent (where 86 percent of this incidence is coming from fuels/utilities, (of which 68 percent is coming from electricity, 11 percent from taxation of kerosene oil and 3.4 percent from gas pipe), 10 percent from durable goods and 5 percent from cutlery and crockery). Other minor incidence contributing categories include; travel and transport group, having an incidence 0.38 percent (of which 95 percent comes from public transportation) and tobacco and chewing products at 0.42 percent.

**Fig. 4. Main VAT Incidence: Main Expenditure Categories**

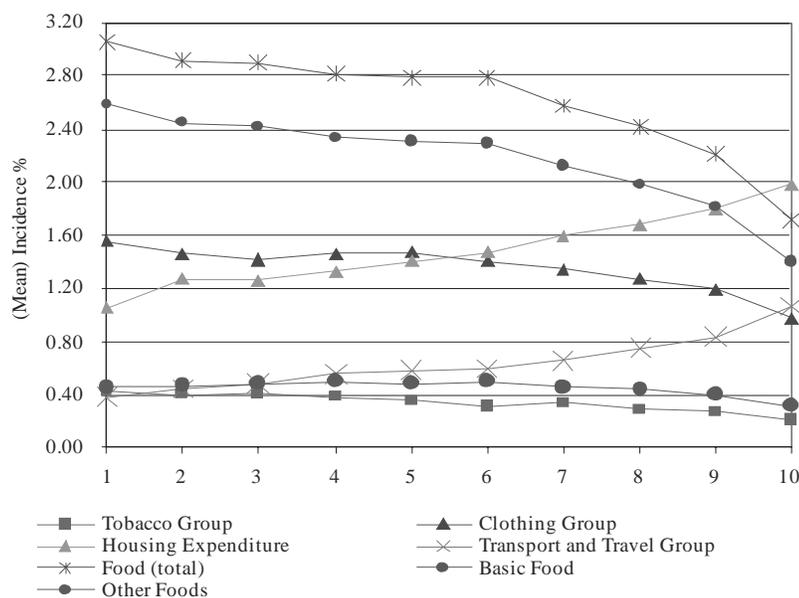


Table 2

*Incidence of GST (2001-02)—Further Disaggregation (Percentage)*

Decile	Food Total Incidence Shares								Housing Expenditure Incidence Shares						Tobacco Incid.	Transport and Travel Incidence Shares				Cloths Incid	
	Incid.	Basic Food	Sugar	Veg. Ghee	Cooking Oil	Others Oil	Other Food	Tea	Incid.	Utility and Fuel	Keros. pipe	Gas	Elect.	Crock.		Durab.	Incid.	Public Transp.	Car		Petrol Charges
1	3.05	2.60	41.10	50.62	0.38	0.26	0.46	94.68	1.05	96.47	11.25	3.44	68.20	5.23	10.08	0.42	0.38	95.91	0.00	3.86	1.55
2	2.92	2.45	42.17	47.99	0.89	0.12	0.47	92.33	1.28	86.80	8.96	4.10	67.37	4.37	10.44	0.39	0.44	96.55	0.05	3.14	1.46
3	2.90	2.42	41.63	46.86	0.89	0.27	0.48	91.73	1.27	86.20	9.46	6.51	64.87	4.53	11.06	0.41	0.48	97.34	0.00	2.52	1.42
4	2.82	2.33	43.00	44.98	1.24	0.09	0.49	90.02	1.34	84.49	9.13	6.61	64.71	4.62	13.28	0.38	0.56	95.18	0.02	4.55	1.46
5	2.79	2.31	42.10	44.03	1.70	0.13	0.48	89.79	1.40	84.19	8.53	6.94	64.08	4.40	13.88	0.35	0.57	93.62	0.02	6.02	1.47
6	2.79	2.30	42.88	43.41	2.48	0.05	0.49	89.84	1.48	83.23	7.24	8.90	63.40	4.06	15.53	0.31	0.59	92.93	0.06	6.64	1.40
7	2.57	2.12	41.65	42.00	3.05	0.11	0.45	88.17	1.60	83.07	7.68	10.01	62.65	3.55	16.22	0.34	0.65	88.52	0.20	10.73	1.35
8	2.42	1.99	41.19	39.84	4.58	0.09	0.43	86.14	1.69	79.78	6.65	12.58	62.21	3.77	20.80	0.28	0.75	84.03	0.16	15.10	1.27
9	2.21	1.81	38.62	37.36	6.63	0.21	0.40	84.11	1.80	77.84	6.08	12.58	63.36	3.40	24.20	0.27	0.84	77.72	0.46	20.81	1.19
10	1.71	1.39	33.25	28.68	12.11	0.12	0.32	75.85	1.98	72.78	3.74	16.49	66.21	2.81	33.46	0.22	1.06	54.73	2.24	41.72	0.98
<b>Avg.</b>	<b>2.62</b>	<b>2.17</b>	<b>40.76</b>	<b>42.58</b>	<b>3.39</b>	<b>0.14</b>	<b>0.45</b>	<b>88.27</b>	<b>1.49</b>	<b>82.48</b>	<b>7.87</b>	<b>8.82</b>	<b>64.73</b>	<b>4.07</b>	<b>16.90</b>	<b>0.34</b>	<b>0.63</b>	<b>87.65</b>	<b>0.32</b>	<b>11.51</b>	<b>1.36</b>

\*Total number of households in (2001-02) is 14,638.

\* HIES 1990-91 contains 6,376 households.

\*\* All figures have been adjusted using Paasche Index.

\*\* Data has been weighted.

\* Population deciles are based on 10 percent of population.

\* 2001-02 VAT rate is 15 percent while for 90-91 VAT rate is 12.5 percent.

As far as the incidence for the richest ten percent households is concerned, it is mainly coming from housing expenditure at 1.98 percent (where 73 percent of total housing expenditure incidence is coming from fuel/utilities (of which electricity contributes 66 percent, gas pipe 16 percent and kerosene only 3.7 percent respectively). This is followed by food at 1.71 percent (of which 33 percent is coming from sugar, 29 percent from vegetable ghee and 12 percent from cooking oils and 0.12 percent from other oil taxation). Transport and travel group is the third major tax category for the richest households contributing around 1.06 percent (of which 54 percent is coming from public transportation, and 41 percent from petrol/diesel expenditures), followed by clothing group at 1 percent and tobacco and chewing products at 0.22 percent.

### (3) Analysing GST (2001-02) Exemption Using Distributional Characteristics of a Good Approach

The question of what the poor really consume has never been really addressed in Pakistan. Are only basic food items most important to the poor as far as their budget is concerned? How important is edible oil consumption to the poor? What sorts of fuel and utilities do the poor really consume? Now all of these are very important questions given which goods are most appropriate for taxation given welfare consideration.

A distributional characteristic approach measures how heavily consumption of each item is concentrated on the poor [Gibson (1998)]. This measure is a direct complement of the theory of marginal tax reform [Newbery (1987)] and was developed with the idea of creating a measure that both captures the welfare impact of price change as well as one that can use the rich information available in household surveys while making minimum assumption regarding the consumer behaviour. This measure has been used in numerous studies e.g. see [Gibson (1998)] for Papua New Guinea [Munoz (2003)] for Ethiopia, [Liberati (2001)] for Italy and [Newbery (1995)] for Hungary and United Kingdom to name a few.<sup>3</sup>

According to [Newbery (1995)],  $d_i$  i.e. the distributional characteristics of good  $i$  can be defined as:

$$d_i \equiv \frac{\sum_h \beta^h q_i^h}{\beta Q_i}, Q_i \equiv \sum_h q_i^h, \bar{\beta} \equiv \frac{1}{H} \sum_h \beta^h,$$

where  $Q_i$  is the aggregate consumption of good  $q_i$  across households,  $\bar{\beta}$  is the average of social weights across households and  $d_i$  will measure how good  $i$  consumption is concentrated towards poor. This brings in the question of how to calculate the social weights? The most simplest and frequently used social weights

<sup>3</sup>See Appendix for detail.

based on utilitarian framework use constant elasticity of substitution social welfare function defined over real consumption per equivalent adult that this paper will use, where  $u^h = (c^h)^{1-\nu} / (1-\nu)$  ( $\nu \neq 1$ ),  $u^h = \log c^h$ , ( $\nu = 1$ ), where  $\nu$  is the coefficient of inequality aversion. Then for an additive (utilitarian) social welfare function,  $W = \sum u^h / H$ ,  $\beta^h = (c^h)^{-\nu}$ . Thus, if  $\nu = 1$ , then transferring £1 to a person who has double standard of living then the other person would yield a social value of only one half of the reference person. While if  $\nu = 2$ , the transfer leads to one-quarter as much and if  $\nu = 1/2$  it would count to 70 percent as much.<sup>4</sup>

The distributional characteristics ranking for 167 items in the HIES (2001-02) is calculated corresponding to relatively little, and higher inequality aversion ( $\nu = 0.5$ , and 2)<sup>\*</sup> and results are presented in Table 3 which clearly shows taxation of which goods is disproportionately hurting the poor more. We find in particular it is the taxation of consumption items like gur/sukkur (11), vegetable ghee (21), sugar (29) and tea (47) which is hurting the poor more, since these goods are being disproportionately more consumed by the poor. Also, taxation of fuels like charcoal (8), firewood (32), coal (63) and kerosene oil (89) is adversely affecting the poor as they are primarily being consumed by the poor households. For the richer households, we find it is the taxation of fuels such as electricity (125), gas pipe (101), gas cylinder (100), and petrol/diesel (163) taxation is more affective since these are disproportionately more consumed by the rich. Thus, putting efficiency consideration aside distributional characteristics clearly show which goods should be taxed and which not and this difference is very clear particularly where taxation of basic fuels and items such as vegetable ghee and sugar are concerned.

By looking at the goods that are exempt or not being taxed we can also see how well the GST exemptions are working. We can see that the exemption of items such as flour (including wheat, maize, barley, jawar, rice), vegetable, pulses and milk is beneficial for the poor, since these are disproportionately more consumed by the poor. However, it appear richer households are benefiting more from the exemptions of consumption items such as mutton, chicken meat and fruits since these lie more within the domain of the richer households consumption. In addition to this, we clearly find one reason why richer households appear to bear a disproportionate lesser burden of GST and that is due to the exemption of most services from GST net! We find services such as financial services ranked (137), entertainment and recreation (161), real estate (143), lawyer (126), and dentist (157) being more consumed by the richer households. Thus, these households are benefiting from the failure of government to incorporate these services within the GST net<sup>5,6</sup> and

<sup>4</sup>The methodology for the measure of *distributional characteristics* is taken from Newbery (1995).

<sup>5</sup>However, due to shortage of space, we are reporting ranking of only those items which are of more general relevance. Please contact author for full list.

<sup>6</sup>Real-estate is proxied by housing, financial services proxied by storage and safe deposits, recreation and entertainment proxied by cinema tickets and rent of video, TV, VCR etc.

Table 3

*Distributional Characteristics of Items Consumed in Pakistan (2001-02)*

Taxable Goods	Social Weights Based on			
	Low Inequality Aversion ( $v = 0.5$ )		High Inequality Aversion ( $v = 2$ )	
	$d_i$	Rank	$d_i$	Rank
	<b>(Important for the Poor)</b>			
Char Coal	0.912	8	0.66	16
Gur/Shakar	0.909	11	0.70	7
Vegetable Ghee	0.880	21	0.63	27
Sugar (Desi or Milled)	0.870	29	0.61	35
Fire Wood	0.868	32	0.61	37
Tea (Black, Green etc.)	0.843	47	0.57	56
Chewing Tobacco and Snuf	0.842	49	0.55	62
Coal Hard and Soft Peat	0.827	63	0.65	19
Footwear	0.815	75	0.52	78
Cigarettes	0.808	83	0.52	79
Kerosene Oil	0.802	89	0.47	106
	<b>(Important for the Rich)</b>			
Gas (Cylinder)	0.792	100	0.47	103
Gas (Pipe)	0.791	101	0.49	101
Expense Travelling by Roads	0.768	117	0.42	124
Electricity	0.749	125	0.43	121
Petrol/Diesel Charges	0.560	163	0.15	162
Exempt Goods				
	<b>(Important for the Poor)</b>			
Wheat and Wheat Flour	0.919	5	0.74	4
Maize, Barly, Jawar etc.	0.918	6	0.69	8
Baggasses, Agri. Waste	0.879	14	0.67	14
Rice and Rice Flour	0.893	15	0.69	10
Radish, Turnip, Carrot	0.891	16	0.67	13
Other Pulses	0.889	18	0.67	12
Dung Cake (Dry)	0.884	20	0.64	20
Dal Chana	0.880	22	0.63	25
Potato	0.876	23	0.64	22
Masoor	0.874	25	0.63	28
Moong	0.872	27	0.62	31
Desi Ghee	0.856	37	0.57	52
Tabacco Raw	0.837	56	0.52	80
Milk (Fresh and Boiled)	0.818	72	0.50	92
Beef	0.818	73	0.52	84
	<b>(Important for the Rich)</b>			
Mutton	0.979	94	0.49	99
Chicken Meat (Fresh, Frozen)	0.782	108	0.47	105
Expense Travelling by Train	0.776	111	0.44	118
General Medicine Services	0.776	112	0.45	113
Lawyer Services	0.749	126	0.38	134
Financial Services	0.721	137	0.36	135
House Rent	0.679	143	0.29	148
Telephone, Telegraph, Postal, etc.	0.650	153	0.25	155
Education	0.648	154	0.25	154
Real-estate	0.636	155	0.28	150
Dentist Services	0.624	157	0.24	156

henceforth facing a proportionate lower level of GST incidence compared to what should be according to their expenditure level. Even though, merit goods such as education (137) and general health services (112) are disproportionately more consumed by the rich households but we do not in anyway advocate their taxation given strong grounds of equity and externality.

Thus, this section clearly shows it is the taxation of items such as vegetable ghee and sugar which is hurting the poor as well as the basic fuels which are being more consumed by the poor. Where as on the other hand richer household which face a similar level of GST incidence despite enjoying a much higher level of consumption is mainly occurring due to failure of government to expand GST to basic services such as real estate, entertainment, consultancy, financial services to name a few. However, it must be kept in mind all of this discussion is carried out keeping equity consideration in mind. If these are given up most importance than government can think about exempting these items and keeping this reform neutral by slightly increasing the GST overall rate on other items, also, it can be debated if a two tier rate structure would better fulfil the equity consideration given it is possible have a lower GST rate for the items predominantly consumed by the poor and a higher rate where consumption is coming from richer households. However, having an exhaustive discussion on the merits and demerits of both of these options is beyond the scope of this paper, but the purpose of bringing this up was to show that the government can exempt items that are important for the poor and still keep reforms revenue neutral if these reforms give a higher weight to equity consideration.

#### ***Have GST Reforms Been Redistributive?***

In order to assess the redistributive effect of GST in 1990 compared to 2002, we compare the distribution of welfare under 1990-91 tax system, with 2001-02 tax system and under a system of equal yield uniform tax system applying to all goods and services.<sup>7</sup> In order to do this we employ two well known inequality indices; Gini (1912), and Atkinson indices for value of inequality aversion, 0.5, 1 and 2 [Atkinson (1970)] and results of this calculations are presented in Table 4.

It appears that the (1990-91) GST system appear to have distributional benefits compared with the uniform tax (e.g. see column 1 and 2). It lead to a decline in inequality ranging from (0.17–0.3 percent), depending on which inequality measure we use. Although, the decline in inequality was small but the direction was correct. Compared to this (2001-02) GST tax system is leading to a more unequal distribution of welfare compared to a uniform equal yield tax. Our results show, depending on the indices used, inequality due to (2001-02) tax system has increased by (0.02 – 0.2 percent). Again this magnitude is quite small but direction is welfare reducing. If we compare column 2 and 5 of Table 4, we see that the inequality during

<sup>7</sup>Equal yield uniform tax system is generated by implicitly assuming own price elasticity of –1 for all commodities and a zero cross price effect. Results in this section have not been weighed.

Table 4

*Progressivity and Redistribution Effect of GST: (1990-91) and (2001-02)*

	(1990-91)			(2001-02)		
	Uniform GST (1)	Actual GST (2)	Change in Inequality (3)	Uniform GST (4)	Actual GST (5)	Change in Inequality (6)
Gini	0.349	0.349	-0.17%	0.3628	0.3630	0.40%
Atkinson (0.5)	0.106	0.106	-0.27%	0.1175	0.1177	0.18%
Atkinson (1.0)	0.182	0.182	-0.29%	0.1962	0.1964	0.10%
Atkinson (2.0)	0.286	0.285	-0.32%	0.2997	0.2998	0.02%

(1990-2002) increased by (4.15 to 11 percent), depending on the welfare measure used. However, all of this increase in inequality can not be attributed to GST tax reform since the underlying welfare distribution before taking into account of effect of GST reform (column 1 and 4) was itself more unequal in (2001-02) but to a smaller extent; (3.9–10 percent). Thus given (2001-02) GST tax system is more regressive than the (1990-91) means that GST reforms has amplified changes in pre tax inequality.

#### IV. CONCLUSION

There is no doubt that VAT has become the most important tax in the country and in years to come its dominance is expected to increase. This development is very important from equity perspective as VAT being a consumption tax has the direct ability to affect each and every household. Even though we did not find GST incidence to be clearly regressive but our result show these reforms to be slightly welfare reducing during the period of (1990-2001). Our results using distributional characteristics approach show that taxation of items such as vegetable ghee, sugar and basic fuels is hurting the poor. We find poor households facing a very similar level of GST tax incidence compared to the richer households despite clear differences in consumption predominantly due to failure of the government to bring more services such as real estate, consultancy, lawyers, financial services and recreational activities within GST net. Thus, even though poor are being penalised by bringing more and more consumption items within GST tax net but richer households are benefiting since consumption of services is not being taxed.

APPENDIX-I

**Distributional Characteristics of a Good**

According to [Newbery (1995)], suppose that the government ranks distributional outcomes according to Utilitarian social welfare function  $W(V^1, \dots, V^h, \dots, V^H)$  where a household  $h$  enjoys utility  $V^h = V^h(m^h + g, p)$  where  $m^h$  is the income before transfers,  $g$  is the government transfers and  $p$  is the price vector. Given this the consumer price  $p_i$  change effect on the social welfare would be:

$$\frac{\partial W}{\partial p_i} = \sum_h \frac{\partial W}{\partial V^h} \frac{\partial V^h}{\partial p_i} = -\sum_h \beta^h q_i^h, \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

where

$$\beta^h \equiv \frac{\partial W}{\partial V^h} \frac{\partial V^h}{\partial g}$$

is the social marginal utility of transferring £1 to a household  $h$ ,  $q_i^h$  is the consumption of item  $i$  by household  $h$  and the last equality of Equation (1) is made possible by Roy's identity. Given the structure of the Equation (1) it is quite clear that the impact of price change will only depend on the level of consumption but also its distribution across population. Usually these two effects are isolated by defining  $d_i$  the distributional characteristics of good  $i$ :

$$d_i \equiv \frac{\sum_h \beta^h q_i^h}{\bar{\beta} Q_i}, Q_i \equiv \sum_h q_i^h, \bar{\beta} \equiv \frac{1}{H} \sum_h \beta^h, \quad \dots \quad \dots \quad \dots \quad \dots \quad (2)$$

where  $Q_i$  is the aggregate consumption of good  $qi$  across households,  $\bar{\beta}$  is the average of social weights across households and  $d_i$  will measure how good  $i$  consumption is concentrated towards poor. Thus, the social welfare effect of price change can be written as

$$\frac{\partial W}{\partial p_i} = -\bar{\beta} d_i Q_i \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (3)$$

This brings in the question of how to calculate the social weights? The most simplest and frequently used social weights based on utilitarian framework use constant elasticity of substitution social welfare function defined over real consumption per equivalent adult that this paper will use, where  $u^h = (c^h)^{1-\nu} / (1-\nu)$ ,  $\nu \neq 1$ ,  $u^h = \log c^h$ ,  $(\nu = 1)$ , where  $\nu$  is the coefficient of inequality aversion. Then for an additive (utilitarian) social welfare function,  $W = \sum u^h / H, \beta^h = (c^h)^{-\nu}$ . (This means that the total utility is averaged over

number of equivalent adults,  $H$ , in order to remove the influence on welfare from changing population over time). Thus, if  $v = 1$ , then transferring £1 to a person who has double standard of living then the other person would yield a social value of only one half of the reference person. While if  $v = 2$ , the transfer leads to one-quarter as much and if  $v = 1/2$  it would count to 70 percent as much.<sup>8</sup>

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<sup>8</sup>The methodology for the measure of *distributional characteristics* is taken from Newbery (1995).

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## Comments

The author in this study has assessed the welfare impact of GST reforms on Pakistani households using two HIES data sets of 1990 and 2001. The paper provides very comprehensive and detailed information based on the following research objectives:

- (1) estimation of VAT incidence at National, Provincial, and Regional level and comparison of the progressivity of GST and VAT;
- (2) examination of VAT (2001-02) data at individual commodity level;
- (3) distributional characteristics of commodities to propose pro-poor VAT reforms.

The study has extended the estimation of tax incidence to regional and provincial level as well. Although the provincial incidence has been calculated and put in the annexure the author did not discuss the results of provincial incidence in the Analysis part. It is also important to note that no detail has been found in the methodology section regarding the estimation of rural/urban and provincial incidence. Particularly knowing the fact that GST is levied at manufacturing stage, to confine the consumer using the good in a particular region or province is subject to errors making the estimates of regional and provincial incidence doubtful. Furthermore, the study has estimated that the rural GST incidence in both 1990-91 and 2001-02 to be higher than urban incidence. This is against the general understanding that rural households consume very little out of the consumer baskets.

While examining tax incidence at commodity level, the analysis has made contradictory inference about some food items e.g. tea. On one hand while disaggregating food into two categories (page 10) *Basic Food* items (Milk, vegetables, fruits, spices, sugar, oil etc.) and other food items (Biscuits, tea eating out etc. Tea is in the group where poorest 10 percent spend 3.3 percent of income making is less attractive to the poor. While analysing distributional characteristics of a good (page 12), tea is part of the group items whose taxation hurt the poor the most. It requires explanation from the author.

In the first page and first paragraph, the study quotes statistics regarding indirect taxes and the contribution of GST and customs duty indirect tax without giving exact reference. It will be appropriate to provide summary statistics showing the performance of various taxes and their individual shares since 1990.

The paper has used percentage changes in tax incidence at commodity level as a comparison tool; it will be more interesting to provide absolute expenditure and their change during the comparison period 1990–2001.

Furthermore, it will be more reasonable to include comparison of VAT incidence in different countries from the literature whether they are in line with the conclusion made by this paper or not? It will help in the overall assessment of VAT at international level.

The results and conclusion of the study that the welfare of the poor households has been reduced due to taxation of items such as sugar, vegetable, ghee and fuels requires the attention of policy-makers, the study also successfully indicates the areas like services such as real estate, consultancy, lawyers, financial services and recreational activities within GST net as they are disproportionately more consumed by the rich class is thought-provoking.

**H. M. Mohsin**

Pakistan Institute of Development Economics,  
Islamabad.