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Tax Incidence by Income Classes in Pakistan

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In this study an attempt has been made to estimate the incidence of federal taxes, for the fiscal year 1978-79, on households belonging to different income-brackets. All the major direct and indirect taxes have been studied. The tax system turns out to be slightly progressive for the country as a whole. For urban areas, it is slightly progressive, and for rural areas it is slightly regressive. Indirect taxes, a major source of the federal government tax revenue, are generally slightly regressive.

INTRODUCTION

In this study, we focus our attention on the distributional aspect of the federal government taxes by estimating their incidence on households belonging to different income groups and living in different areas. Progressivity of various taxes and the tax system as a whole is estimated. The study can be very useful to policy-makers in evaluating the distributional consequences of different federal taxes in the country. Moreover, in view of the government's serious interest in mobilizing domestic resources to meet the development needs of the country, this study can be very helpful to policy-makers in identifying the income classes that are relatively undertaxed and can be taxed further.

While economic literature is rich in the country studies of tax incidence,[1] one finds only three such studies for Pakistan. The study by Javaid Azfar, an unpublished Ph.D. thesis, was not available to us.[2] Alauddin and Raza (1981) deal with the incidence of some of the federal taxes for 1966-67 and for the years from 1968-69 to 1971-72. This study does not take import duties into account which are a major

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[1] A critical review of the literature on tax incidence for developing countries can be found in Bird and De Wulf (1973) and De Wulf (1975).

[2] There is a reference to this study in De Wulf (1975) and in some other studies.

source of federal government tax revenue. Moreover, they have used nominal rates of taxes on the items of final consumption to compute the tax paid by different households. This approach entails two main problems. First, the taxes on raw materials and intermediate inputs, which constitute a substantial part of the total tax revenue, are completely ignored. Secondly, the problem of tax evasion, which is quite serious in Pakistan, is overlooked, Jeetun (1978), in his study of tax incidence for 1972-73, has taken into account the problem of tax evasion by using tax collections rather than nominal tax rates, but his treatment of the taxes on raw materials and intermediate inputs is a bit arbitrary. Our study is aimed at estimating the incidence of all major federal taxes across income classes for the fiscal year 1978-79, while not overlooking the above-mentioned problems in the previous studies.

DATA AND METHODOLOGY

To estimate tax incidence, what we need is a comprehensive household income and expenditure survey, an input-output table, and data on the collection of various types of taxes. The Household Income and Expenditure Survey (1983) on which this study is based was conducted for the calendar year 1979. The sample size of the Survey was fairly large, consisting of 22,575 households representing almost all rural and urban areas of the country.[3] Since data on tax collection are available only for fiscal year, we have estimated the burden of federal taxes for the fiscal year 1978-79, assuming that the consumption patterns during the calendar year 1979 were the same as during the fiscal year 1978-79. This assumption is quite harmless as consumption patterns do not change rapidly. Similarly the input-output table [Saleem *et al.* (1983)] available for this study was for the year 1975-76 so that we had to assume that input-output coefficients remained unchanged between 1975-76 and 1978-79. Again this assumption seems to be reasonable since the gap between the two periods is very narrow.

This study covers all the Federal Government taxes except export duties. The reason for not including export duties is our lack of knowledge about who bears the burden of such duties. Fortunately, export duties constitute a very small part of total tax revenue. In 1978-79 their share in total federal taxes was only 1.74 percent. The taxes on commodities are the most important in Pakistan in terms of their contribution to total tax revenue. Their contribution to total federal tax revenue was 85.41 percent in 1978-79. These taxes include customs duties, excise duties, sales taxes and

[3] Some of the areas not included in the Survey were Federally Administered Tribal Areas, Military Restricted Areas and the Tribal Areas of Peshawar, D. I. Khan and Malakand Divisions. Population of these areas was about 6.7 percent of the total population of Pakistan according to the 1972 Population Census [Government of Pakistan (1983), p. xxi]. The exclusion of these areas from the Survey has no significant effect on our results.

surcharges, and their respective percentage shares in total tax revenue in 1978-79 were 43.13, 29.46, 8.24, and 4.58.

To take care of the problem of tax evasion we have used tax collections rather than nominal tax rates. A number of government publications have been consulted in compiling data concerning different types of taxes collected for various commodities. Data on import duties are taken from Government of Pakistan (1982), while the figures for the federal excise duties and surcharges are drawn from Government of Pakistan (1979). A breakdown of sales taxes by commodities is not available for the year 1978-79. We therefore have tried to estimate them by using the available information. The detailed procedure for estimation is given in our earlier study [Malik and Saqib (1985)].

To allocate commodity or indirect taxes among households, we can start by assuming that taxes are shifted forward to the consumers. Theoretically, full shifting of an indirect tax on a commodity can take place only when either demand curve for the commodity is perfectly inelastic or supply curve is perfectly elastic. One can argue in favour of these assumptions to justify tax shifting. However, Prest (1955) has pointed out that these assumptions, in the context of the calculation of tax incidence, can lead to contradictory conclusions.[4]

The shifting of indirect taxes can also be approached from the point of view of international trade. In an open economy when goods are being freely traded, domestic prices net of taxes will equal international prices. Consumers have to buy commodities at domestic prices instead of international prices. Indirect taxes are thus fully shifted forward to consumers.

To determine empirically the extent of shifting of indirect taxes, the approach generally followed is of regression analysis. In the context of Pakistan a number of studies have been undertaken to ascertain the extent of shifting of indirect taxes. Radhu (1965) regresses changes in prices on changes in the rates of sales and excise taxes and concludes that these taxes are not shifted to the consumers. Irfan (1974) disputes these findings on the grounds that "Most of the observations (in Radhu's regression analysis) pertained to small changes in sales tax and no attempt was made to weight commodities by their contribution to excise and sales tax collections". [Irfan (1974), p. 67]. Irfan selects only two commodities, cigarettes and petroleum products, which contribute most to the total excise duty receipts and finds that a "very high proportion" of excise duties is passed on to the consumers. Bilquees Naqvi (1975) extends Irfan's work by including more commodities and by considering sales tax in addition to excise duties, and finds that these taxes are "transferred partly to the consumers". The latest and the most comprehensive study on this issue is by Jeetun (1978a). This study covers all the four types of commodity taxes and leads to the conclusion that excise duties and sales taxes (including surcharges) are

[4]See [Prest (1955, 1956) and Conard (1955)] for an exchange of views on this topic.

shifted forward to the consumers. The range of tax shift for different commodities is from 72 to 93 percent. For import duties, he finds not only a full shift but "some degree of pyramiding" also. From this empirical evidence, it can be concluded that commodity taxes are definitely shifted to the consumers, while there can be a disagreement on the exact extent of tax shifting. In this study we have followed the standard assumption of full shifting of commodity taxes onto the consumers.

The taxed commodities can be divided into two broad categories. The commodities which are directly consumed and the commodities which are totally or partly used as inputs to the other commodities. Taxes collected for the first type of commodities are allocated to the households in different income brackets according to their share in total consumption of those commodities. To allocate taxes on the second type of commodities (i.e., raw materials and intermediate inputs) to final consumption, we have used the information contained in the "Revised PIDE Input-Output Table of Pakistan's Economy: 1975-76". [Saleem *et al.* (1983)].

In addition to commodity taxes, there are income and corporate profit taxes. Income tax is levied on incomes of individuals and corporate profit tax is collected on profits of companies and registered firms. The shares of these taxes in total tax revenue in 1978-79 were 4.98 percent and 9.25 percent respectively. For income tax we have assumed that it is not shifted and stays with the legal tax-payer. The Household Income and Expenditure Survey [Government of Pakistan (1983)] reports direct taxes paid by households in different income brackets. Direct taxes are not defined in the Survey but it is reasonable to believe that their main component is income tax. The absolute amounts of direct taxes as reported in the Survey grossly understate the burden of direct taxes. However, their distribution across income classes seems more reliable. Since agricultural income is exempted from income tax, it can safely be assumed that the entire burden of income tax is borne by the urban population. We have further assumed that households in the lowest five income brackets did not pay any income tax as their incomes were lower than the exemptions available at that time in the form of personal allowance, earned income relief and family allowance. Total income tax collected for 1978-79 was distributed among the remaining income classes according to the distribution of the direct taxes prepared from the survey.

On the shifting of corporate profit tax, the available theoretical and empirical literature reveals an absence of consensus.[5] One extreme point of view is that the tax is fully shifted to the consumers, while on the other extreme it is argued that it is entirely borne by the shareholders. Unfortunately, no empirical work has been done on Pakistan to determine the extent of shifting of the corporate profit tax. In our study, we have carried out different experiments based on different assumptions about the extent of the tax shifting. In the standard case, we have assumed, like

[5] See, for example [Gillespie (1980), pp. 35–41].

others,[6] that 50 percent of the tax falls on consumers and 50 percent on shareholders. The part of the tax falling on consumers has been distributed to households belonging to different income brackets according to their shares in total consumption expenditures. The part of the tax on shareholders needs to be distributed according to the distribution of dividends among shareholders. However, such data are not available. Therefore, we have assumed that all the shareholders belong to urban areas and are concentrated in the top two income brackets of the income distribution, and the tax has been distributed among households of these income brackets according to their shares in total savings of these income brackets.[7]

The findings of the Household Income and Expenditure Survey [Government of Pakistan (1983)] show that the consumption patterns of households in the rural and urban areas are not the same. Moreover, the sources and their contribution to the incomes of the households in the two areas also differ. Therefore, we have estimated tax incidence for the rural and the urban households separately. Data on tax collection by commodities are for the country as a whole. The amount of a tax on a particular commodity is distributed between the rural and urban areas according to their shares in total consumption of that commodity. Once all the taxes are allocated to households in different income groups, they are divided by their personal incomes to obtain effective tax rates.[8]

By looking at the pattern of effective tax rates, one can classify a particular tax or the whole tax system: as progressive if effective tax rate rises with income; as regressive if the converse is true; and as proportional if rates remain the same for all income brackets. It is quite possible that a tax may exhibit regressivity, proportionality, and progressivity in different ranges of the income distribution. In such cases, if we want to know whether the tax on the whole is progressive, proportional or regressive, we need a summary measure.

Such a measure has been proposed by Suits (1977). Suits's index is similar to Gini coefficient (a measure of income inequality) and is computed from the Lorenz curve constructed from cumulative percentage of tax-burden and cumulative percentage of income share of households. The value of Suits's index lies between +1 and −1. A positive value of the index shows that the tax is progressive while a negative value indicates regressivity. A zero value of the index suggests that the tax is proportional. When the value of the index becomes exactly +1, it means that the highest income bracket bears the entire tax-burden; and in the case of the index value exactly equal

[6] Gillespie (1980) and Jeetun (1978) also have made this assumption.

[7] Same assumption has also been made by Jeetun (1978).

[8] The personal incomes of the households in different income brackets as reported in the Survey [Government of Pakistan (1983)] are sample values; these have been blown up to national level to calculate effective tax rates. To blow sample values to national level, income shares of different income groups have been computed using sample values, and then these income shares have been multiplied with the national figure of personal income.

to −1, it implies that the entire tax-burden falls on the lowest income bracket. Some weaknesses of the index have been pointed out by Davies (1980) and Kienzle (1980). But we think that it is a useful index which can be used in combination with effective tax rates to measure tax progressivity.

RESULTS

Before embarking on a detailed analysis of the results, a note of caution seems to be in order. The results presented in the study are subject to many qualifications and need to be interpreted with care. As far as effective tax rates are concerned, greater confidence can be reposed in the incidence pattern which they exhibit across income groups than in their exact numerical values.

The results for rural areas are given in Table 1. Looking at the effective tax rates, one observes that the tax system as a whole appears, with some exceptions, to be regressive over the entire measured income range. To be more specific, the tax system is regressive up to an income level of Rs 500. The effective tax rate fluctuates between income levels of Rs 500 and Rs 1000, then it declines upto income level of Rs 3500, making the tax system regressive again. The effective tax rate records a slight increase for the highest income bracket (Rs 3501 and above) as compared to the previous income bracket. A negative and small value of the Suits's index shows that the tax system is slightly regressive.

The regressivity of the entire tax system is due to the regressive nature of its components. Import duties, the largest single source of federal government tax revenue, have exactly the same incidence pattern as for all taxes combined. The result appears somewhat surprising because generally necessities are either totally exempt from import duties or subject to much lower rates as compared to luxuries. In fact, a large proportion of import duties is collected on raw materials, intermediate products and machinery, which makes import duties slightly regressive. The incidence pattern exhibited by sales taxes is similar to that of import duties. One possible explanation for this could be that the substantial proportion of sales taxes collected comes from imported goods. Another major source of federal government revenue is excise duties. We may describe them as proportional upto an income level of Rs 1000, even though there are some small fluctuations in the effective tax rate. The effective tax rate consistently declines beyond the income level of Rs 1000, making the excise duties regressive over this income range. Surcharges contribute a small proportion to the total tax receipts. Their share in 1978-79 was 4.58 percent. Surcharges are levied on a few products – mostly intermediate goods like fertilizer and petroleum products. Consequently, their impact spreads over the entire economy. Surcharges, on the whole, are slightly regressive. The values of Suits's index for import duties, excise duties, sales taxes and surcharges show that all these indirect taxes are slightly regressive.

Table 1

Effective Tax Rates and Values of Suits's Index for Different Federal Taxes for the Fiscal Year 1978-79 – Rural Areas

Monthly Income Class (Rupees)	Import Duties	Excise Duties	Sales Taxes	Surcharges	All Commodity Taxes Combined	Corporate Profit Tax	All Taxes Combined
Effective Tax Rates (Taxes Paid by Households as Percentage of their Personal Incomes)							
Up to 300	5.492	3.490	1.075	0.835	10.892	0.738	11.630
301 – 400	5.221	3.522	1.030	0.788	10.561	0.698	11.259
401 – 500	4.898	3.261	0.954	0.724	9.837	0.663	10.500
501 – 600	5.254	3.409	1.010	0.710	10.383	0.648	11.031
601 – 800	4.718	3.252	0.918	0.673	9.561	0.632	10.193
801 – 1000	5.152	3.394	0.999	0.697	10.242	0.619	10.861
1001 – 1500	4.395	3.139	0.873	0.597	9.004	0.583	9.587
1501 – 2000	4.097	2.869	0.829	0.544	8.339	0.556	8.895
2001 – 2500	3.837	2.706	0.779	0.501	7.823	0.514	8.337
2501 – 3000	3.621	2.681	0.755	0.452	7.509	0.503	8.012
3001 – 3500	3.647	2.550	0.774	0.428	7.399	0.483	7.882
3501 and above	3.990	2.384	0.883	0.457	7.714	0.415	8.129
Total	4.626	3.138	0.917	0.632	9.313	0.595	9.908
Value of Suits's Index	– 0.051	– 0.046	– 0.037	– 0.079	– 0.050	– 0.053	– 0.051

The reported results for corporate profit tax are based on the assumption that 50 percent of the tax is borne by consumers and 50 percent by shareholders. Since it is assumed that all the shareholders live in urban areas, the results for the rural areas reflect only that part of the tax which falls on consumers. The corporate profit tax is slightly regressive as the effective tax rate consistently declines over the entire measured income range. In different experiments when it is assumed that the share of the tax falling on consumers is greater or less than 50 percent, the tax still remains slightly regressive in all the cases.

The results for urban areas are reported in Table 2. The value of Suits's index for all taxes combined shows that the tax system as a whole is slightly progressive. However, the effective tax rates do not follow a consistent pattern. For the highest three income brackets they show progressivity, and for the remaining income classes, with a few exceptions, they indicate regressivity.

All commodity taxes combined exhibit slight regressivity. Though effective tax rate fluctuates for some income brackets, yet in most cases it registers a decline. The behaviour of import duties, excise duties and surcharges is very similar to that of all commodity taxes combined. Sales taxes are very slightly progressive.

The values of effective tax rates and Suits's index clearly demonstrate that income tax is highly progressive. The results for corporate profit tax in the table are based on the assumption that the tax burden is equally shared by consumers and shareholders. The part of the tax on shareholders is allocated to top two income brackets according to the procedure discussed previously. The value of Suits's index shows that the tax on the whole is progressive. Based on effective tax rate results, it is slightly regressive for the lowest ten income groups and highly progressive for the highest two income brackets. In different experiments, when more than 50 percent burden of the tax falls on consumers, the value of Suits's index declines, while it increases when it is assumed that relatively more burden falls on shareholders. In all these experiments, the values of Suits's index indicate that the tax system as a whole remains slightly progressive.

The incidence patterns of various taxes for the country as a whole are reported in Table 3. On the basis of the value of Suits's index, the tax system as a whole is slightly progressive. All commodity taxes combined is slightly regressive, and its components – customs duties, excise duties, sales taxes and surcharges – also exhibit similar behaviour. The value of Suits's index for sales taxes is so small that it is better to characterize them as proportional. Income tax is highly progressive and corporate profit tax also reflects progressivity. The effective tax rates for various taxes convey more or less the same message as the values of Suits's index do.

CONCLUSIONS

In this study an attempt has been made to estimate the incidence of federal

Table 2

Effective Tax Rates and Values of Suits's Index for Different Federal Taxes for the Fiscal Year 1978-79 – Urban Areas

Monthly Income Class (Rupees)	Import Duties	Excise Duties	Sales Taxes	Surcharges	All Commodity Taxes Combined	Income Tax	Corporate Profit Tax	All Taxes Combined
Effective Tax Rates (Taxes Paid by Households as Percentage of their Personal Incomes)								
Up to 300	6.090	5.192	1.399	0.869	13.550	0.000	0.774	14.324
301 – 400	4.926	4.809	0.962	0.788	11.485	0.000	0.888	12.373
401 – 500	4.792	4.753	0.956	0.787	11.288	0.000	0.624	11.912
501 – 600	5.860	4.882	1.204	0.792	12.738	0.000	0.625	13.363
601 – 800	5.082	4.960	1.058	0.776	11.876	0.000	0.669	12.545
801 – 1000	4.997	4.749	1.065	0.776	11.587	0.229	0.607	12.423
1001 – 1500	4.870	4.377	1.022	0.697	10.966	0.409	0.585	11.960
1501 – 2000	4.723	4.054	1.013	0.626	10.416	0.732	0.471	11.619
2001 – 2500	4.523	4.210	0.994	0.585	10.312	1.155	0.533	12.000
2501 – 3000	4.420	3.791	1.001	0.541	9.753	1.056	0.533	11.342
3001 – 3500	5.092	3.772	1.206	0.569	10.639	2.563	3.338	16.540
3501 and above	4.624	3.894	1.135	0.462	10.115	5.760	6.985	22.860
Total	4.824	4.285	1.063	0.636	10.808	1.740	2.122	14.670
Value of Suits's Index	– 0.023	– 0.049	0.012	– 0.105	– 0.035	0.617	0.514	0.126

Table 3

Effective Tax Rates and Values of Suits's Index for Different Federal Taxes for the Fiscal Year 1978-79 – All Areas

Monthly Income Class (Rupees)	Import Duties	Excise Duties	Sales Taxes	Surcharges	All Commodity Taxes Combined	Income Tax	Corporate Profit Tax	All Taxes Combined
Effective Tax Rates (Taxes Paid by Households as Percentage of their Personal Incomes)								
Up to 300	5.558	3.679	1.111	0.839	11.187	0.000	0.743	11.930
301 – 400	5.180	3.703	1.021	0.788	10.692	0.000	0.725	11.417
401 – 500	4.879	3.529	0.954	0.735	10.097	0.000	0.656	10.753
501 – 600	5.362	3.672	1.045	0.724	10.803	0.000	0.644	11.447
601 – 800	4.796	3.619	0.948	0.695	10.058	0.000	0.640	10.698
801 – 1000	5.108	3.781	1.018	0.720	10.627	0.065	0.616	11.308
1001 – 1500	4.566	3.583	0.926	0.633	9.708	0.147	0.583	10.438
1501 – 2000	4.384	3.412	0.913	0.581	9.290	0.335	0.517	10.142
2001 – 2500	4.188	3.475	0.889	0.544	9.096	0.591	0.524	10.211
2501 – 3000	4.102	3.348	0.903	0.505	8.858	0.636	0.533	10.027
3001 – 3500	4.528	3.295	1.038	0.514	9.375	1.564	2.226	13.165
3501 and above	4.398	3.355	1.045	0.460	9.258	3.705	4.641	17.604
Total	4.698	3.556	0.970	0.633	9.857	0.635	1.152	11.644
Value of Suits's Index	−0.036	−0.017	−0.004	−0.083	−0.029	0.765	0.395	0.056

taxes on households belonging to different income brackets. All the major direct and indirect (commodity) taxes have been covered, and the taxes on raw materials and intermediate inputs have been allocated to final consumption through the input-output table. A major source of government revenue is commodity taxes, which are generally slightly regressive. The tax system is slightly progressive for the country as a whole. For urban areas, it is slightly progressive; and for rural areas, it is slightly regressive. The reason the tax system is slightly regressive in the rural areas is the absence of direct taxes there.

Looking at the effective tax rates, one finds that households in the urban areas pay relatively more taxes than their counterparts in the rural areas. However, the incidence patterns of all taxes combined for lower and middle income groups are not much different in the two areas. It is only in the top income brackets that we find relatively more consistent tax progressivity in the urban areas.

Most of these results compare favourably with the findings of an earlier study on Pakistan for the fiscal year 1972-73 by Jeetun (1978). Jeetun in his study concludes that "although the tax system is progressive the degree of progressivity is too low and inadequate" (p. 64). He also found that households in the urban areas were paying higher taxes than households in the rural areas. His finding that the tax system is more progressive in the urban areas as compared to the rural areas is in line with our findings. Direct taxes have been found highly progressive in both the studies. However, indirect taxes as a whole have been found slightly progressive in Jeetun's study, while in our study they turn out to be slightly regressive. This difference of the result could be due to differences in the time periods and methodologies of the two studies.

The effective tax rates of this study imply 0.97 elasticity of total federal tax revenue with respect to personal income. This elasticity estimate is somewhat higher than the elasticity estimate based on time series data which is 0.81 [Government of Pakistan (1986-87), p. 46]. The latter elasticity estimate is with respect to GNP and covers both federal and provincial taxes.[9]

The tax system of the country has been found slightly progressive, but to make it more progressive, greater reliance should be placed on direct taxes. The share of direct taxes in total tax revenue must be enhanced over time. Moreover, commodity taxes on raw materials, intermediate inputs, and machinery should be avoided. Only those commodities of final use should be taxed which are consumed mainly by households in the upper income brackets.

Study of taxes is quite important and useful in itself but it covers only one

[9] Elasticity of total federal tax revenue with respect to GDP has been estimated in a recent study by Gillani (1986). Using time series data and two alternative methods, she provides estimates of short-run and long-run elasticity. According to Divisia Index Method, short-run and long-run elasticity estimates are 0.83 and 1.26 respectively. While Proportional Adjustment Method results are 0.71 and 1.22.

side of the budget, i.e., the revenue side. Equally important is the expenditure side, which still remains unexplored. As government provides different types of services to the people, to get the net redistributory impact of the budget we must know how the benefits of the government expenditures are distributed across income groups. The study of the benefits is no doubt more complicated and involves much more arbitrariness than the study of taxes. The paucity of data makes it further difficult to carry out such a study. Still, because of its importance, such a study needs to be undertaken in the future.

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