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Personal Income Tax Progressivity in Pakistan

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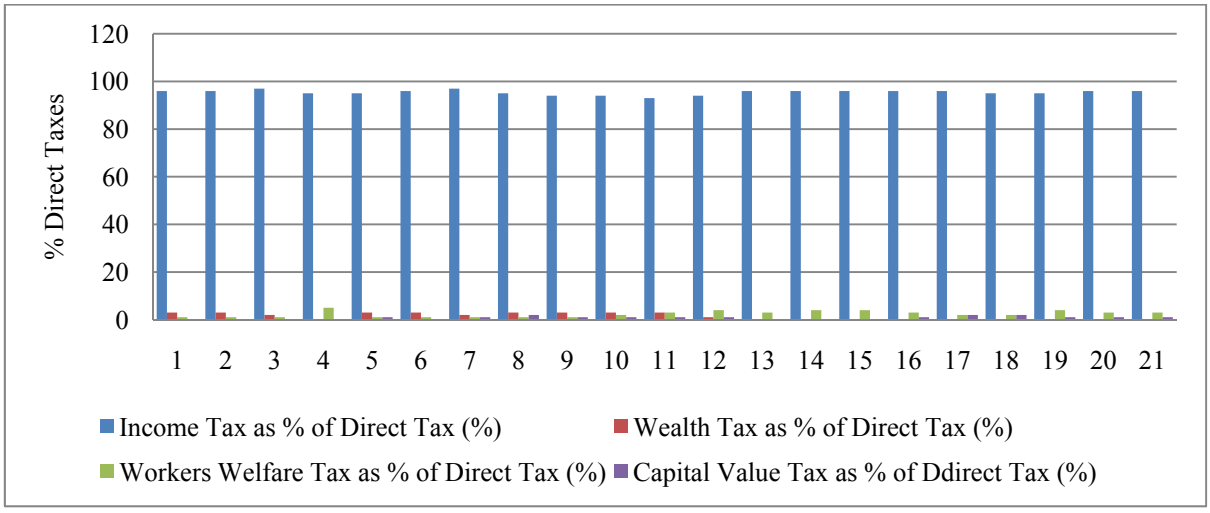
Abstract. Government income can be broadly categorized into three main categories namely Tax Revenue, Non Tax Revenue, Non-Revenue Receipts. Tax revenue can be divided into two major parts namely direct taxes and indirect taxes. Personal income tax is the major portion of direct taxes. This paper aims to analyse the progressivity or regressivity of personal income taxes in Pakistan. To find the progressivity or regressivity, we employ the average tax rate, marginal tax rate and suits index. This study concludes that progressivity of personal income taxes in Pakistan is very minor and that the tax burden is also very low.

Keywords: Income Tax, Average Tax Rates, ,Marginal Tax Rates, Suits Index, Progressivity.

1. Introduction

Government income can be broadly categorized into three main categories namely Tax Revenue, Non Tax Revenue, Non-Revenue Receipts. Two main sources of tax revenue are direct taxes and indirect taxes. In Pakistan, personal income tax, capital value tax, workers welfare fund and wealth tax are the main sources of direct tax, while sales tax, excise duty and customs are the main sources of indirect tax. The main contributor in direct taxes is income tax. The share of income tax in direct taxes in Pakistan is more than 96 percent. Figure 1.1 shows the share of different taxes in direct taxes in Pakistan.



Source: State Bank of Pakistan (Handbook of Statistics on Pakistan Economy)

Figure. 1.1: Share of different taxes as percentage of direct taxes.

Personal income taxation is amongst the oldest and one of the commonly used instruments of fiscal policy. Besides partly fulfilling the government expenditure needs, income tax is also aimed at reducing the inequality gap in the society. They are transformed in to progressive structures so that principles of fairness are fully accomplished. (Creedy 1999).

The main purpose of this paper is to investigate the progressiveness of personal income tax in Pakistan. Section 2 of this paper explains theoretical framework of the study. Section 3 provides the analysis of average and marginal tax rates. Section 4 shows the calculation of suit index and section 5 concludes the study.

2. Theoretical Framework

A tax is a progressive tax if the amount of tax increases with the increase in the income of individual. And if the amount of tax decreases with the increase in income then the tax is a regressive tax. There are different ways to measure tax progressivity. Pigou (1929) suggested that the progressivity can be measured in terms of average rates of progression. Effective rate of progression method was developed by Slitor (1948). He used the difference between marginal and effective rates divided by net income. Musgrave and Thin (1948) further enhance the work of Pigou (1929) and Slitor (1948).

The two common ways to find the tax progressivity are

- Average tax rate (ATR)
- Marginal tax rate (MTR)

The formula for average tax rate is $ATR = \dfrac{\text{Total Tax Paid}}{\text{Value of Tax Base}}$ which represent the ratio of total taxes to total income.

The formula for average tax rate is $MTR = \dfrac{\Delta \text{ in Total Tax Paid}}{\Delta \text{ in Value of Tax Base}}$ which shows the ratio of change in income tax paid to the change in value of tax base. If MTR is greater than ATR then the tax system is progressive, if MTR is smaller than ATR then the tax system is regressive and if MTR is equal to ATR then the tax system is proportional.

Another widely known measure of tax progressivity is suits index '*S*' which was developed by Suits (1977). He developed curve similar to Lorenz curve. He define the index of progressivity *S* in terms of *K*. the formula is given as under

$$S = \frac{(K - L)}{K} = 1 - \frac{L}{K}$$

Where *L* is the area of triangle *OABC* and *K* is the area of triangle *ABC*.

Figure 2.1 shows the Lorenz curve

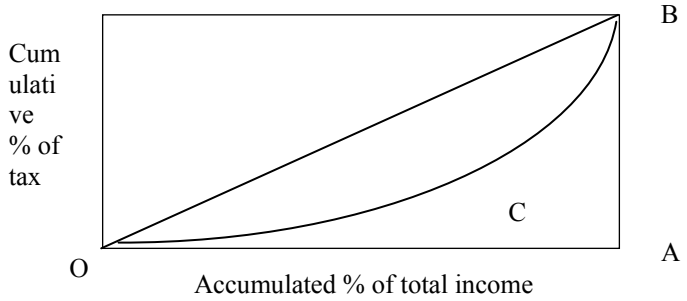
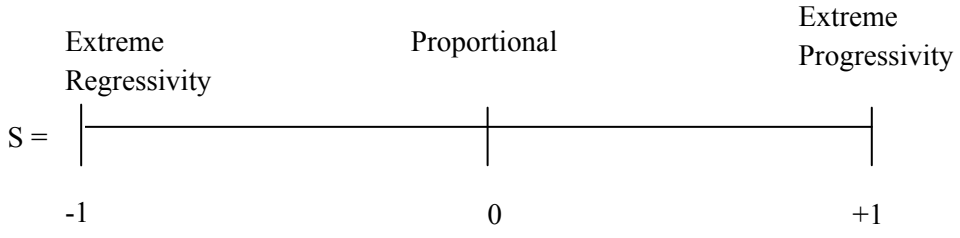


Figure. 2.1: Lorenz curve.

The tax will be progressive if the value of *S* is greater than 0.



Another measure known as Gini index was introduced by Khkwani (1977). The Gini index is measured as 1 minus twice the area under the Lorenz curve. In this paper we use average and marginal tax rates method and Suits index to find the progressivity in income tax in Pakistan.

3. Analysis of Average and Marginal Tax Rates

3.1. Average Tax Rates

Generally the analysis of average tax rates shows that the tax system is progressive because average tax rates increases with the income base for all the years but when the income levels were divided into quintiles then progressivity was not clear. The income levels were divided into four quintile according to lower middle income, middle income, lower higher income and higher income. The 1st quintile consists on income ranging from PKR[1] 80,000 to PKR 2,180,000, the 2nd quintile consists on income ranging from PKR 2,280,000 to PKR 3,230,000, the 3rd quintile consists on income ranging from PKR 3,330,000 to PKR 6,380,000 and the 4th quintile consists on income exceeding PKR 6,930,000. Table 3.1 shows the average tax rates for income quintile groups.

Table. 3.1: Average Tax Rates

Total Income (PKR)	1991-1994	1995-1998	1999	2001-2003	2004	2005	2006-2007	2008	2009	2010	2011
1st Quintile	0.00	0.10	0.00	0.04	0.03	0.00	0.02	0.001	0.001	0.009	0.006
2nd Quintile	0.27	0.35	0.00	0.19	0.19	0.02	0.13	0.17	0.18	0.17	0.16
3rd Quintile	0.27	0.35	0.21	0.17	0.17	0.22	0.44	0.29	0.29	0.29	0.29
4th Quintile	0.26	0.28	0.25	0.26	0.26	0.22	0.60	0.69	0.69	0.52	0.52

Source: Federal Board of Revenue (FBR) Pakistan.

Table 3.1 shows that the average tax rates from 1991 to 2004 are not clear for every quintile. Sometimes ATR increases and sometimes decreases. From the year 2005 to 2011 average tax rates increases for every quintile which shows the level of progressivity.

3.2. Marginal Tax Rates

The marginal tax rates for every year are also increasing with the increase in income indicating the level of progressivity, but for the income quintile groups same as average tax rate they are not clear. The marginal tax rates for the income quintile groups are shown in table 3.2.

Table. 3.2: Marginal Tax Rates

Total Income (PKR)	1991-1994	1995-1998	1999	2001-2003	2004	2005	2006-2007	2008	2009	2010	2011
1st Quintile	0.00	0.10	0.00	0.075	0.075	0.00	0.06	0.005	0.005	0.048	0.04
2nd Quintile	0.50	0.50	0.00	0.325	0.325	0.035	0.31	0.45	0.45	0.41	0.41
3rd Quintile	0.50	0.50	0.55	0.25	0.25	0.37	0.78	0.53	0.53	0.53	0.53
4th Quintile	0.35	0.35	0.35	0.35	0.35	0.30	0.75	0.91	0.91	0.72	0.72

Source: Federal Board of Revenue (FBR) Pakistan.

Table 3.2 shows that the marginal tax rates for the year 2008 to 2011 are increasing for every quintile indicating progressivity. For the years 2005 to 2007, the MTR decreases in last quintile and from 1991 to 2004 sometimes MTR increases and sometimes decreases. By comparing the marginal and average tax rates for every quintile it shows that the MTR is greater than ATR for all the quintiles in every time period which means that the tax system is progressive.

[1] PKR = Pakistani Rupees.

4. Suits Index

To calculate the suits index the equation of parabola is used because the shape of suits index curve is like parabola. The equation can be written as

$$y = ax^2 + bx + c \quad \text{---------- Equation 4.1}$$

To determine the value of a, b and c three points on the curve are chosen. To understand the calculation an example for the years of 1991-94 is given.

Points on the curve taken are (0,0) (34,20) (100,100)

By substituting these values in equation 4.1

$$a = 0.0053$$
$$b = 0.4083$$

To calculate the actual area under the curve integration is used

$$L = \int_0^{100} 0.0053x^2 dx + \int_0^{100} 0.4083x dx \quad \text{---------- Equation 4.2}$$

$$L = 0.0018x^3 \,|_0^{100} + 0.2042x^2 \,|_0^{100} \quad \text{---------- Equation 4.3}$$

$$L = 3842$$

The area of triangle is given as

$$Area = \frac{1}{2} \times base \times height \quad \text{---------- Equation 4.4}$$

$$Area = 5000$$

So the Suits index of progressivity for the year is

$$S = 1 - \frac{3842}{5000} = 0.2316 \quad \text{---------- Equation 4.5}$$

The calculated Suits index of progressivity for all the time periods are given in table 4.1

Table 4.1: Index of Progressivity

Years	Index of Progressivity, *S*
1991-94	0.232
1995-98	0.058
1999	0.055
2001-03	0.20
2004	0.132
2005	0.265
2006-07	0.089
2008	0.061
2009	0.134
2010	0.147
2011	0.174

This table shows that all the indices are positive indicating that the tax system is progressive.

The index of progressivity starts from 0.232 and decreases to .055 then again increased to 0.20 and after increases, again decreases till 2008 and after increases for every year. From the table we can see that the indices for the years 1995 to 1999 and 2006 to 2008 are very close to 0 which means that the tax system was more proportion and equitable.

5. Conclusion

The results of our study show that the tax system in Pakistan is progressive. Less income group pays lower tax and higher income group pay higher tax. The ATR and MTR shows that the tax rates of all income

groups are reduced over the years but it is still progressive. The distribution of tax burden in Pakistan is equitable but from 2009 it is going towards inequitable tax burden.

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