REVENUE POTENTIALS IN PAKISTAN: AN ECONOMIC ANALYSIS

By

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CERTIFICATE

This is to certify that this thesis entitled: "**Revenue Potential in Pakistan: An Economic Analysis**" submitted by Syed Hamza Ali is accepted in its present form by the Department of Economics, Pakistan Institute of Development Economics (PIDE), Islamabad as satisfying the requirements for partial fulfillment of the degree of **Master of Philosophy in Economics**.

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“Dedicated to my Parents

Syed Mohsin Ali and

Mumtaz Mohsin”

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Chapter 1

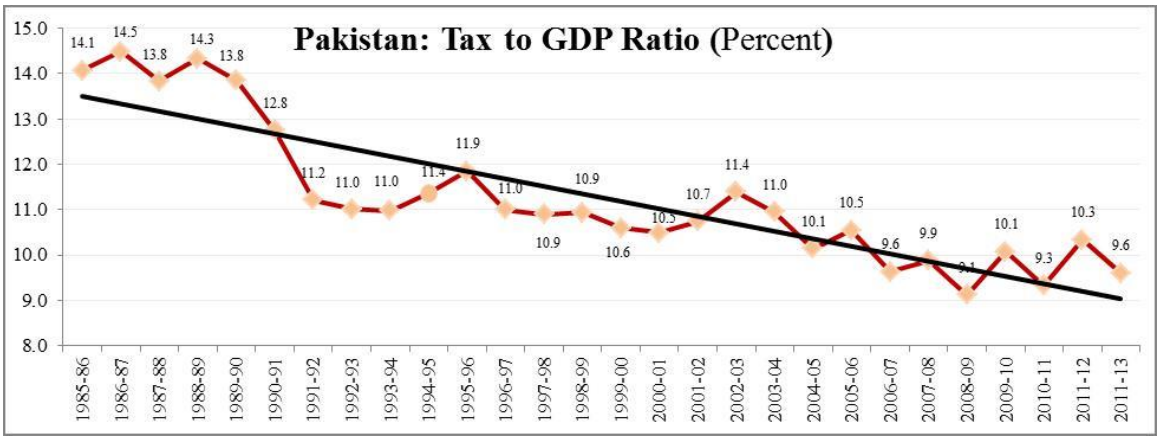
INTRODUCTION

1.1 Background of the study:

Tax revenues play an important role in the overall working of the economy. Government expenditures are considered to have a positive impact on the growth of the economy and the expenditures are based on the total revenue collection. Most of the developing countries suffer from the budget deficit problem so they are always looking for new sources of revenue collection. The growing government expenditure puts more pressure on the internal revenue generation and the rigidity of the tax system makes it more difficult to raise the revenue. Generally, the tax collection of the developing countries is less than their expenditure so great effort is required in their revenue generation. For developing countries, a higher value of elasticity is preferable as it indicates the automatic growth in the tax revenue that helps in meeting the increasing government expenditure. However, if the elasticity of the tax system is low then the revenue generation is done through the discretionary changes, which can be seen through the buoyancy value. The in elastic revenue system forces the government to make regular discretionary changes in order to maintain or increase the government revenue. These frequent changes have a negative impact on the resource and the expenditure allocation and distribution in the economy. Pakistan is facing a serious revenue problem as it is unable to collect enough revenue due to which the government needs to borrow. Tax to GDP ratio is an important measure of the revenue situation of a country. Tax to GDP

ratio of Pakistan varied between 8.5 to 9.7 percent for the period 2014-15. The history of the Tax to GDP ratio for Pakistan can be seen in the following graph.

Figure 1.1: Tax to GDP ratio of Pakistan



Source: Economic Survey of Pakistan 2015-16

Lower revenue to GDP ratio means a higher public debt. The public debt of the country is 63% of GDP (Economic Survey of Pakistan, 2015-16) which is quite high as compared to other developing countries. Public debt servicing in the first nine months of the current fiscal year consumed 46% of the total tax revenue. (Economic Survey of Pakistan, 2015-16) This is an alarming figure of a country like Pakistan, which is struggling to raise tax revenue and much of the collected tax revenue serves the public debt servicing. Only 54% of the tax revenue is left for the government to run the country.

Tax Structure in Pakistan

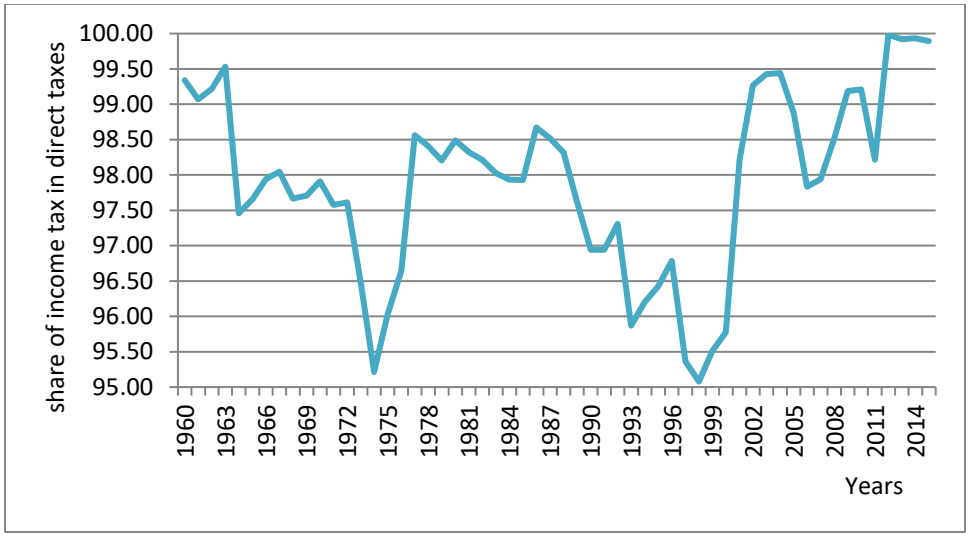
Pakistan's tax system has undergone some major changes in the past decades. To study the revenue generation problem of the country we must understand the tax structure of the country. From the very beginning, Pakistan's tax structure presented a regressive

nature. The share of indirect taxes (and surcharges) has been more than share of direct taxes in the consolidated (federal and provincial) revenue resources.

Pakistan's fiscal economy has been dependent on indirect taxes for mobilization of resources, which clearly increases excess burden on the economy as indirect taxes creates distortion in the resource allocation. It is also reported by (Ahmed & Rashid, 1984) that in 1949-50 share of direct taxes were just 25 percent of the consolidated revenues, which was 33 percent in 1959-60 and it fell to just 14-17 percent in the 1970s. However, in the later periods efforts were made to cover for this deficiency. As noted by (Fatima & Qazi, 2001), the emphasis of fiscal policy in 1990s was to increase the direct taxes share in tax revenue, which eventually did increase a bit, but the overall tax to GDP ratio could not be increased. If we look at the composition of tax revenue, then it becomes evident that reliance on indirect taxes for generating revenues has been predominant. In figure 1.2 it is observable that the total direct taxes (TDT) as a percentage of GDP had been very low from the very beginning and their growth as compared to total indirect taxes (TIT) have also be sluggish

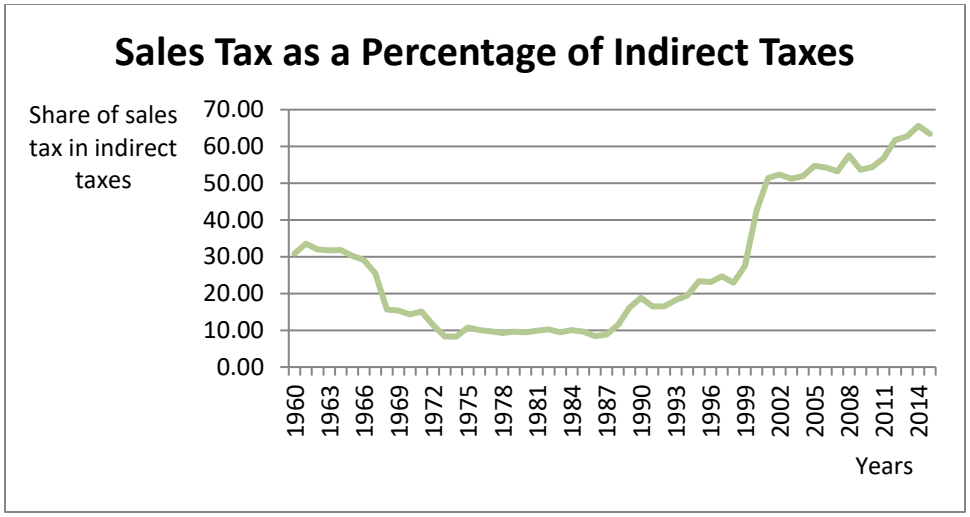
In the recent years, federal direct taxes as a percentage of GDP are increasing in Pakistan. The share of direct taxes in total FBR tax collection is 37.9%.on the other hand, the share of indirect taxes is 62.1% (Economic Survey of Pakistan 2015-16). This is because only 0.3 percent of the population pays income tax. Around 7 million people are eligible to pay taxes but only around 0.8 million people pay their taxes. Under the direct taxes 70% of the tax revenue is collected through withholding taxes. (Sherani,2015)

Figure 1.3: Income Tax as Percentage of Direct Taxes



The graph shows the variation in the share of income tax as a percentage of direct taxes. It can be seen that in the last decade the reliance on income tax within the direct taxes has increased significantly. The 62.9% share of indirect taxes is a clear indicator that the government is not getting enough revenue from the direct taxes because there are not enough people in the tax circle. Therefore, the government has to shift to indirect taxes to generate revenue. This is the problem of most of the developing countries; their revenue generation depend on the indirect taxes. The higher share of indirect taxes increase the income inequality in the country. Within the indirect taxes, sales tax is the main head; the government of Pakistan has increased the general sales tax from 16% to 17% in the previous budget, another clear indication of the heavy reliance on the indirect taxes.

Figure 2: Sales Tax as a Percentage of Indirect Taxes



This can be seen in the above graph, the share of sales tax as a percentage of indirect taxes has increased significantly in the last decade.

For the estimation of buoyancy, we decompose the elasticity into two components, tax to base and base to income elasticity. The decomposition of elasticity is helpful in identifying the source of increase in revenue growth or the reason behind the decrease in revenue growth. It is also helpful in identifying and controlling the variable for policy purpose. The change in policy can be done through the tax to base ratio as it is in control of the government authority while the base to income is not in control of the government authorities.

There has been extensive literature conducted on individuals' behavioral responses to taxation and the ramifications on tax revenue with a wide variety of results that lead to opposite policy conclusions. It is important to use the valuable conclusions of these studies to guide and shape my own research. (Muriithi M K, 2003)

1.2 Literature Gap:

There is some literature on elasticity and buoyancy of the tax system of Pakistan. These studies cover the years from 1972-2003. The results show that generally the buoyancy of the indirect taxes is higher than the direct taxes. There is no significant study after 2003 on the buoyancy of the tax system. My study aims to estimate the current parameters of buoyancy and the elasticity of the income tax slabs.

1.3 Objective of the study:

- To estimate the income tax slab elasticity of Pakistan.
- To estimate the current parameters of buoyancy for different taxes in Pakistan.

1.4. Limitation of the study:

The study should has been conducted on the micro data. That is the data of the income tax filers. Since we do not have access to the micro data, we will use the secondary data for our study.

1.5 Organization of the Thesis

The rest of the dissertation is organize as follows: Review of literature on tax elasticity and buoyancy discusses in the second section furthermore, clarifies the buoyancies of different countries at disaggregated level. The section 2 also discusses the literature on the theory of tax elasticity and its existence in different countries. Methodology and data description are explained in the third section. Results and estimation portrays in the fourth section and shows the buoyancy at disaggregated level

by using two stage least square method. Conclusion and policy recommendation given in the last chapter.

Chapter 2

LITERATURE REVIEW

Before studying the results, recommendations and conclusions drawn by this thesis, it is far critical to have a huge concept of the modern development in the theoretical and empirical literature relating to the tax revenue. In the introduction chapter, we concisely talked about the accessible literature and inferred that the literature does not build up unambiguously the way of the relationship between tax rate and tax revenue. Therefore, it is essential to further discover the literature to classify the gaps and elucidate the mechanism to fill those gaps. A huge group of literature hypothetically analyzes the tax buoyancy for developed and developing countries, including Pakistan. Numerous experimental studies find the connection between tax rate and the government revenue related with it. In this section, we have studied the literature related to the objectives of the thesis. There is extensive literature presented on the relationship between tax rates and tax revenue. The studies provide different results and different policy suggestions.

(Nutahara, 2011) Studied the relationship between tax rate and tax revenue at disaggregated levels for labor, capital and consumption taxes in Japan based on a neoclassical growth model. The model is calibrated to the Japanese data, and the average marginal taxes are used to calculate the marginal labor and capital taxes of the model. The study find that while the labor tax rate is lower than that of the peak of the Laffer

curve[1], the capital tax rate is very close to that of the peak of the Laffer curve or even larger than it under certain specifications. On the other hand, (Trabandt & Uhlig, 2011) examined the same relationship for the US, the EU-14 and individual European countries by using a neo classical growth model featuring constant Frisch elasticity (CFE) preferences. It has shown that the US can increase tax revenues by 30% by raising labor taxes and by 6% by raising capital income taxes. For the EU-14 economy, 8% and 1% are obtained. A dynamic scoring analysis shows that 54% of a labor tax cut and 79% of a capital tax cut are self-financing in the EU-14. The capital tax rates in Sweden and Denmark are higher than those at the peaks, the study finds that Japan is similar to these countries. When the consumption tax rate is high, the tax rate for labor and capital taxes is smaller, and this problem becomes more serious. We also find that to maximize total tax revenue, the government should increase the labor tax rate but decrease the capital tax rate.

2.1 Studies of Elasticity parameters by using Net-of-tax:

The literature that estimates the elasticity of taxable income with respect to net-of-tax[2] has produced different results and different policy implications. (Lindsey, 1988) and (Feldstein, 1995) reported high income elasticity from their analyses of the tax rate changes in 1980's. Lindsey reported the elasticity of 1.6-1.8 and the maximum elasticity was of 2.5 for the high-income earners. Feldstein find the elasticity between the range of 1.04 to 3.05. These findings show that high-income earners are on the right side of the Laffer curve during the period as their elasticity is greater than 1 in both the studies.

[1] Laffer curve shows the relationship between tax rates and tax revenues collected by the government.
[2] Net-of-tax is the amount left after paying the taxes. It is calculated by taking gross figures, like the net cash collected from the sale of an asset, and subtracting the taxes paid.

Which means that as the tax rate increases the government revenue would decrease. These two studies also support the findings of (Jones & Laffer, 1981) that "increase in tax rates could as well reduce as increase government tax revenues" Recent literature, however, has not supported the findings of (Lindsey, 1987) and (Feldstein, 1995).

(Heim, 2009) estimated the elasticity of the taxable income to the net-of-tax share using a panel data of tax returns that follows a random sample of tax payers from 1999 to 2005. The final sample consists of 96,873 observations. The model estimated the effect of change in net-of-tax rate (independent variable) on the taxpayer's income. The findings of the study show that the elasticity of taxable income to current year's net-of-tax share lies between 0.3 and 0.4 and the elasticity of a broader measure of income falls between 0.1 and 0.2 overall. (Goolsbee, 2000) also tried to repeat the analysis done by (Lindsey, 1988) and (Feldstein, 1995). He examines the responsiveness of taxable income to changes in marginal tax rates using detailed compensation data on several thousand corporate executives from 1991 to 1995. He used top marginal income tax rate as independent variable and obtained the elasticity of less than 1.

2.2 Studies of Elasticity parameters by using marginal income tax rate:

There is a broad literature available on the elasticity of the taxable income with respect to the top marginal income tax rate[3]. A marginal tax rate is the amount of tax paid on an additional dollar of income. The marginal tax rate increases as the income increase. In the related studies, main objective was to find the elasticity estimates of taxable income. (Kazman, 2014) examined the relationship between tax rates and tax revenues.

[3] Marginal income tax rate refers to the amount an individual would pay on one additional dollar of income earned.

He focus on all tax units who were subject to a marginal income tax rate at or above 29% rate during the period being studied. The paper used income tax revenue as the dependent variable and top marginal income tax rate as independent variable to explain movements in government income tax revenue. The elasticity of tax revenue related to the top marginal tax rate that is generated in this regression indicates that tax rate increases are positively related to increases in tax revenue. The study finds that an increase in the top marginal income tax rate of 1% causes income tax revenue to increase by more than 1%.

Earlier, (Saez,2004) used income tax return data from 1960 to 2000 to analyze the link between reported incomes and marginal tax rates. He estimated the level and the shares of total income accruing to various upper income groups using the large cross sectional individual tax return data annually released by Internal Revenue Services (IRS) since 1960. He used the simple extension of the static labor supply model to estimate the behavioral responses to income taxation and used top marginal income tax rate and time trends to control for exogenous factors that affect taxable income. He produces long-term elasticity measures of 0.6-0.7 for the elasticity of the top 1% income share with respect to the top marginal tax rate. (Jones & Laffer, 1981) studied the relationship between income tax rates and income tax revenue for the period 1951 to 1964. The authors find that in the years following 1964, decreasing tax rates could raise tax revenue. This points to the presence of the Laffer curve during this time period and implies that the U.S. was on the right side of this curve. The problem with the study was that it was conducted only for the period of 13 years. (Auten & Carroll,1994) of the Treasury Department's office of Tax Analysis subsequently estimated the same elasticity using the much larger panel of tax returns for 1985 and 1989 that is available only inside the Treasury. Their sample

includes more than 5,000 taxpayers with 1985 marginal tax rates of 50 percent. They report an elasticity of 1.33 with a standard error of 0.15. (Hausman,1997) estimated the marginal tax rate for the top income earners and their results state that the marginal tax rate fell by 44 percent for the top income earners and by 100 percent for low income earners but actually rose for nearly a third of all taxpayers. The tax rate on capital gains rose by as much as 40 percent for some taxpayers while changing very little for other. (Long, 1999) analyzed the relationship between marginal tax rates and taxable income with a large cross section of income tax returns filed by individuals who face different marginal tax rates because of state income tax differentials. Tax returns data for the study was collected from the Internal Revenue Services(IRS) report. The model specifies the taxable income reported on the individual tax returns to be a function of state marginal income tax rate and various non-tax control variables. The empirical results suggest that an increase in the marginal tax rate reduces taxable income primarily because taxpayers claim larger deductions. High income taxpayers are found to be more responsive to tax rate changes than lower-income individuals.

There is some literature, which relates the changes in tax rate to the unobserved economy. It states that, as the tax rate increase people tend to reduce their activities in the white sector and increase their activities in the unobserved sector to avoid the tax increase. (Heijman & Van Ophem, 2014) analyzed the Laffer curve for 12 OECD countries. They state that economic activities are a decreasing function of the taxation rate. Consequently, total tax revenue increases with the taxation rate at its lower levels and decreases against it at its higher levels. This paper considers both effects: decreasing activities in the white sector combined with increasing activities in the black sector. It

examines the computation of the maximum tax revenue generating taxation rate for a number of OECD countries. The model is based on the idea that potential income Y consist of three parts: (1) registered or white income; (2) non-realized income because of inactivity of a part of the population; and (3) Non registered income or the black sector. If the tax rate increases, the chance for becoming inactive in the sector of registered income or for becoming active in the black sector increases. The results show that in all the countries except Sweden, The optimum tax rate is higher than the actual one.

(Feige & McGee, 1993) also incorporated the unobserved sector in their study and they stated that the shape and position of the Laffer curve depends upon the strength of supply-side effects, the progressivity of the tax system and the size of the unobserved economy. Using alternative parameterizations of each of these effects, they obtain rough empirical estimates of the Laffer curve for Sweden. The model consists of three basic parts: total market output, Y, consisting of monetary observed and monetary unobserved income. The findings show that Sweden have passed its Laffer curve peak.

2.3 Tax Buoyancy and Tax Elasticity:

Tax buoyancy refers to changes in actual tax revenues due to the changes in income as well as due to the changes in discretionary measures such as tax rates and tax bases.(Mukul, 1977) it is estimated as percentage change in revenue divided by percentage change in tax base. Tax elasticity may be defined as the ratio of a percentage change in adjusted tax revenue to a percentage change in income. The major difference between them is that elasticity is calculated as if there is no change in the tax rates and tax base. That is it tells us that what revenue would have been if last year’s laws continued to apply this year.

(Mansfield, 1972) estimated the elasticity and buoyancy of the tax system for Paraguay. He found that the coefficient of elasticity was 1.14 for the period 1962-1970. He also estimated the elasticity of different taxes. Income tax elasticity was found to be 1.08, wealth taxes 1.52. Export taxes had the lowest elasticity of 0.6. The buoyancy of the whole tax system was 1.69. The major limitation of the study was that it used only 8 years of data. The latest study by (Samwel & Isaac, 2012) examined the tax buoyancy and tax elasticity for the tax system in Kenya for the period 1986-2009 using time series data. Ordinary least square method was used to estimate the parameters. The results show that the elasticity for the whole tax system is 0.509, which implies that an increase in GDP will have less than proportionate increase in the tax revenue. Tax buoyancy for the whole tax system is 0.525. This means the tax system yielded a 0.525% change in tax revenue, as a result of both automatic changes and discretionary policy, for every 1% change in GDP. Thus, a decreasing proportion of incremental income was transferred to the government in the form of taxes, implying that the tax system was less buoyant. Moreover, (Yousuf & Huq, 2013) estimated the elasticity and buoyancy of major taxes for Bangladesh for the period 1980-2011 using time series data. Johansen Co Integration method was used to estimate the relationship between the variables. The paper examines the elasticity and buoyancy of each type of tax. The elasticity for total tax revenue was 1.14 whereas for custom duties it is less than unity (0.78). The coefficient of buoyancy was found to be 1.24. The higher coefficient of buoyancy indicates the fact that discretionary changes have strong influence.

2.4 Literature on Pakistan:

Regular studies were conducted for the elasticity and buoyancy estimates for Pakistan till 2004. (Gillani, 1986) estimated the elasticity and buoyancy of the federal taxes in Pakistan for the years 1972 to 1983. For this, she used divisia index method and the proportional adjustment method. The results show that total tax elasticity was greater than unity and even greater than buoyancy. The buoyancy for indirect taxes was greater than 1 and for income tax it is less than 1. (Ahmed, 1997) Assessed the federal government tax elasticity and buoyancy for numerous taxes over the time 1973-1990. His results indicate that due to low buoyancy and elasticity of excise duty and income tax, generally elasticity of taxes was very low. The performance of import duty is better and sales tax is most elastic and buoyant and is likely to perform fine in future as well. However, on the expenditure side, the buoyancy of current expenditure has enlarged over time while that of development expenditure has stimulated in the reverse direction.

(Mukarram, 2001) estimated the elasticity and buoyancy of the major federal taxes for Pakistan over the period 1981-2001. She used chain-indexing technique to estimate the elasticity and buoyancy of the tax system. The results show that the elasticity and buoyancy are higher for the direct taxes followed by the sales taxes. While for the custom and excise duties, the elasticity is lower. (Bilquees, 2004)investigated the elasticity and buoyancy of the tax system in Pakistan over the period 1973-2003. The study uses the Divisia Index technique to find the elasticity and the buoyancy estimates for the period. The findings show that the elasticity for the total tax revenue with respect to total GDP is less than unity. The elasticity of the sales taxes is higher than the any other taxes. The coefficient of indirect tax is high because of the withholding tax, which is an indirect tax.

2.5 Literature Table:

Author	Research Title	Objective	Data	Methodology	Findings
(Lindsey.B, 1987)	Did ERTA raise the share of taxes paid by upper income tax-payers? Will TRA86 be a repeat	To estimate the potential revenue consequences of tax reform act of 1986 (TRA86)	Years covered: 1980-1984	Dependent variable: Taxable income Independent variable: top marginal income tax rate	He finds the elasticity estimates of 1.6 and 1.8 for the elasticity of taxable income with respect to top marginal income tax rate.
(Feldstein, 1995)	The effect of marginal tax rates on taxable income: A panel study of the 1986 Tax reform act	To estimate the sensitivity of the taxable income to changes in tax rate.	Years covered: 1985-1988	Dependent variable: Taxable income Independent variable: top marginal income tax rate	Feldstein finds the elasticity estimates of 1.04 to 3.05 for the elasticity of taxable income with respect to marginal income tax rate. The results are similar to the study carried out by (Lindsey,1987)
(Heim, 2009)	The effect of recent tax changes on taxable income: evidence from a new panel of tax returns	To estimate the elasticity of taxable income with respect to net-of-tax share	Years covered: 1999-2005	Dependent variable: Taxable income Independent variable: net-of-tax rate and other factors affecting taxpayers income.	The findings of the study show that the elasticity of taxable income to current year's net-of-tax share lies between 0.3 and 0.4 and the elasticity of a broader measure of income falls between 0.1 and 0.2 overall. The results do not support the findings of (Lindsey,1987) and (Feldstein,1995)

(Goolsbee, 2000)	What happens when you tax the rich evidence from executive compensation.	To examine the responsiveness of taxable income to changes in marginal tax rates.	Years covered: 1991-1999	Dependent variable: Taxable income Independent variable: top marginal income tax rate	Goolsbee finds the elasticity estimates of 0.0 to 0.7 for the elasticity of taxable income with respect to top marginal income tax rate.
(Saez, 2004)	Reported incomes and marginal tax rates: Evidence and policy implications	To analyze the link between reported incomes and marginal tax rates.	Years covered: 1960-2000	Dependent variable: income share of top decile of income earners Independent variable: Top marginal tax rates, time trends to control for exogenous factors.	The findings show the elasticity estimates of 0.6-0.7 for the elasticity of top 1% income share with respect to the marginal income tax rate.
(Long, 1999)	The impact of marginal tax rates on taxable income: evidence from state income tax differentials	To analyze the relationship between marginal tax rates and taxable income.	Used 66,723 tax returns for the year 1991	Dependent variable: Taxable income Independent variable: top marginal income tax rate and other nontax control variables	The results suggest that an increase in the marginal tax rate reduces taxable income primarily because taxpayers claim larger deductions. High- income taxpayers are found to be more responsive to tax rate changes than lower-income individuals.

(Giertz 2010)	The elasticity of taxable income during the 1990's: New estimates and sensitivity analyses.	To estimate short and long run responses of taxable income to changes in tax rates.	Years covered: 1984, 1985, 1988-1995	The estimation is done by using two stage least square method.	The findings show that the Long term elasticity estimates range from 0.19 to 0.33 and short term elasticity estimates from 0.78 to 1.46
(Mansfield, 1972)	Elasticity and buoyancy of a tax system: A method applied to Paraguay	To find the elasticity and buoyancy estimates for Paraguay	Years covered:1962-1970	Ordinary Least Square Method	Elasticity of the tax system was greater than unity.
(samwel & isaac, 2012)	Elasticity and Buoyancy of tax components and tax systems in Kenya	Estimate the buoyancy and elasticity of the tax system in Kenya.	Years covered:24 years of time series data was taken.	OLS and proportional adjustment method was adopted for elasticity estimates.	All major tax components in Kenya are inelastic.
(Yousuf & Huq, 2011)	Elasticity and buoyancy of major tax categories: Evidence from Bangladesh and its policy implications	To evaluate the elasticity and buoyancy of the major taxes for Bangladesh	Years covered:1980-2011	Johansen Co-integration technique	The elasticity and buoyancy estimates were found to be greater than one for total tax revenue.

(Gillani, 1986)	Elasticity and Buoyancy of federal taxes in Pakistan.	Evaluate the performance of the fiscal system on the basis of estimates of revenue productivity.	Years covered:1971-1982	Divisia Index Method and proportional Adjustment Method	Elasticity was greater than one.
(Mukarram, 2001)	Elasticity and buoyancy of major taxes in Pakistan	To find the coefficients of buoyancy and elasticity for major taxes in Pakistan.	Years covered: 1981-2001	OLS. Chain indexing technique was used for the estimation of elasticity.	Elasticity and buoyancy were greater than one for direct taxes and less than one for indirect taxes.
(Bilquees, 2004)	Elasticity and buoyancy for the tax system in Pakistan	To estimate the elasticity and buoyancy for the tax system in Pakistan	Years covered: 1973-2003	Divisia index technique	Elasticity for total tax revenue was less than unity.

Chapter 3

METHODOLOGY

In the literature review chapter, we empirically and theoretically analyze the elasticity and buoyancy of tax system is Pakistan. The first objective of this chapter is to discuss the model specification of the study. The second objective is to discuss data and variable construction used in this analysis. The last objective of this chapter is to explain the econometric technique used to analyze the tax buoyancy of Pakistan.

3.1 Data Description:

In this study, we have used data sets for different types of direct and indirect taxes. We will start of by defining each kind of variable used.

Direct Taxes:

Direct taxes are those taxes that are directly charged on the income or profits of the person not on the goods.

Income Tax:

Income tax is directly charged on the income. It can be charged as percentage of income or lump sum.

Indirect Taxes:

Indirect taxes are the kind of taxes that are not charged directly on the income rather they are charged on the goods and services that are generally used by the public. Indirect taxes

are easy to collect as compared to direct taxes. It involves custom duty, excise duty and sales tax.

Custom Duty:

Customs Duty is a tariff or tax imposed on goods when transported across international borders. The purpose of Customs Duty is to protect each country's economy, residents, jobs, environment, etc., by controlling the flow of goods, especially restrictive and prohibited goods, into and out of the country.

Excise Duty:

An excise duty is an inland tax on the sale, or production for sale, of specific goods or a tax on a good produced for sale, or sold, within a country or licenses for specific activities. Excise duty is distinguished from custom duty, which are taxes on importation.

Sales Tax:

A sales tax is a consumption tax imposed by the government on the sale of goods and services. A conventional sales tax is levied at the point of sale, collected by the retailer and passed on to the government.

3.2 Model Specification and Regression equation:

In this study, we will use time series data for the estimation of buoyancy of different taxes and the elasticity of income tax. There are two main steps in the methodology. First, we will estimate buoyancy of each kind of tax. Second, we will estimate the elasticity of income tax with respect to income tax slabs. For buoyancy, data has been collected for

the period 1970-2014. The estimation for buoyancy is simple. We will define the tax base of each tax and regress the tax revenue on it.

$lnTR_i = \alpha_1 + \beta_1 ln(TB)_i + u_1$ ---------- (3.1.1)

$ln\,TB_i = \alpha_2 + \beta_2 ln(GDP)_i + v_1$ ---------- (3.1.2)

TR = Total revenue

i = Type of tax

TB= Tax base

u_1 and v_1 are white noise error terms

3.1.2 Tax Buoyancy at disaggregated level

The estimation of buoyancy is done at the disaggregated level. In order to obtain consistent estimates of the buoyancy the regressions we use the following equation:

$$LnX_i = a_0 + a_1 LnY_i + U_i$$

In the next step the buoyancy of tax base with respect to total income is derived in a similar manner as the tax to tax-base buoyancy are derived. However in the case of tax base to total income elasticity econometric problem of simultaneity was anticipated and corrected accordingly. As the tax base variables (Private Consumption Expenditures (PCE), Imports (M), Total Trade (TRD), Non Agriculture GDP at market prices (NAGDPMP), Value added of manufacturing and services (VAMS), Value Added of Electricity and Gas Distribution (VAEGD) and Value added of Transport and Communication Services (VATCS)) are simultaneously determined with total income (here GDPMP), hence running a regression with endogenous right hand side variables does not provide consistent results. This problem was solved by using the 2SLS method.

For example if we take the proxy base of sales tax to be the private consumption expenditures and imports (PCE+M) then tax base to total income elasticity can be found by estimating the following equation:

$$Log(PCE + M) = a_0 + a_1 \log(GDPMP) + U_i$$

Here, a_1 is the elasticity of sales tax base with respect to total income. But due to the simultaneity problem we cannot use this regression equation. So in the first step we have to replace the right hand side variable of $GDPMP_t$ with such an instrument which has no correlation with U_i and is highly correlated with endogenous variable $GDPMP_t$. Here FLGDPMP stands for fitted value of LGDPMP (log of GDP at Market Prices) and LGGCE is the log of general government consumption expenditures. As the new variable FLGDPMP has the characteristics of high correlation with the original variable LGDPMP and has no correlation with the error term of original equation. Now instead of using the original values of LGDPMP, FLGDPMP was used in equations for obtaining the tax base to income elasticities. The procedure is same as used for the tax to base elasticity i.e. using the difference equations instead of level to obtain robust results.

The disaggregated data for direct taxes was not available so due to the unavailability of the data we have estimated the buoyancy for federal direct taxes. For indirect taxes, the data was available at disaggregated level. The buoyancy is estimated for custom duty, excise duty and sales tax. The base for federal direct taxes is non-agricultural GDP as the agricultural income tax is a provincial matter. For each indirect tax, different base is defined. Custom duty is charged on the imported and the exported goods but we will only consider the imports as most of the exports get the tax rebate. For excise duty, total value added of the manufacturing sector was taken as base. It was not the very exact base as the

manufacturing sector includes many such items which are not under excise tax but it was the most appropriate proxy available so it was used. For sales tax, the private consumption expenditure and imports were taken as base as sales tax is charged on the domestic goods consumed and the imported items consumed (Table 3.1).

Table 3.1: Tax Revenue and their base

Tax Revenue	**Tax Base**
Custom duty	Imports
Sales tax	Private Consumption expenditure + Imports
Income tax	Private Consumption Expenditure
Federal Excise Duty	Value added Manufacturing Sector
Federal Indirect tax	Private Consumption expenditure + Imports
Other direct taxes	Private Consumption Expenditure

3.2 Data and Variable Construction:

For the estimation of the income tax elasticity the data is collected from the Income Tax SRO's issued by the FBR for the period 1983-2015. Elasticity for each slab is estimated by using average tax rate and the marginal tax rate. Elasticities are estimated at the slab average and at the upper limit of the slab. Slab average is calculated by taking the average of upper and lower limit. The same process is done by assuming that most of the people file their return close to the upper limit of the slab. So the elasticity of the income tax is also calculated at the upper limit of the slab. For the estimation of the elasticity, we first assume that people submit their tax return on the average income of the slab. The average of the slab is estimated as:

$$SA_t = \frac{U_L - L_L}{2}$$ ---------- (3.2.1)

Where,

$SA_t = Slab\ Average$

$L_L = Lower\ Limit\ of\ the\ slab$

$U_L = Upper\ limit\ of\ the\ slab$

Based on the slab average, the average tax rate is estimated as

$$ATRS_t = (SA_t - D_L) \times (Tax\ Rate) + Fixed\ Tax\ Rate$$ ---------- (3.2.2)

Where,

$ATRS_t = Average\ Tax\ Rate\ of\ Income\ Slab$

$D_L = Deduction$

$Tax\ rate =$ Percentage Tax Rate

$$MT_t = ATRS_t - ATRS_{t-1}$$ ---------- (3.2.3)

Where,

MT_t= Marginal Tax of each Slab

$ARTS_t = Average\ Tax\ Rate\ estimated\ in\ equation$(3.2.2)

$$MI_t = SA_t - SA_{t-1}$$ ---------- (3.2.4)

Where,

$MI_t = Marginal\ Income\ of\ each\ Slab$

$SA_t = Slab\ Average\ estimated\ in\ equation$ (3.2.1)

$$MTRS_t = \frac{MT_t}{MI_t}$$ ---------- (3.2.5)

Where,

$MTRS_t = Marginal\ Tax\ Rate\ of\ each\ Slab$

$MT_t = Marginal\ tax\ estimated\ in\ equation$ (3.2.3)

$MI_t = Marginal\ Income\ estimated\ in\ equation$ (3.2.4)

$E_t = \frac{MTRS_t}{ATRS_t}$ ---------- (3.2.6)

Where,

$E_t = Elasticity\ of\ each\ slab$

$MTRS_t = Marginal\ Tax\ Rate\ of\ each\ Slab$

$ATRS_t = Average\ Tax\ Rate\ of\ Income\ Slab$

Average tax rate is estimated by dividing the average tax by the slab average. Marginal tax rate is estimated by dividing the difference of average tax to the difference of slab average. The slab elasticity is calculated by taking ratio of marginal tax rate to average tax rate. This procedure is done for each slab for each year. For the last slab of each year the elasticity is not estimated because there is no upper limit of the slab and the estimated for average slab is not applicable.

The elasticity for each slab is also estimated by assuming that the people file their return at the upper limit of the income tax slab. For this, average tax is taken as the upper limit of the slab.

$SA_t = U_L$

$SA_t = Slab\ Average$

$U_L = Upper\ limit\ of\ the\ Slab$

$ATRS_t = (U_L - D_L) \times (Tax\ Rate) + Fixed\ Rate$ ---------- (3.2.7)

Where,

$ATRS_t = Average\ Tax\ Rate\ of\ each\ Slab$

To estimate Average tax rate, the ratio of average tax to slab average is used. For the calculation of marginal tax, we divide the difference of average tax to the difference of slab average. By using these, we estimate slab elasticity by taking ratio of marginal tax rate to average tax rate. Finally, elasticity is estimated by dividing the marginal tax rate to the average tax rate.[4]

3.3 Econometric Methodology:

3.3.1 Unit Root Test:

The econometrician proposed the formal test to find out either a time series consist a trend or the trend is deterministic or stochastic. In order to test the stationarity, unit root tests are specifically acquainted in the econometric literature. There is a plenty of unit root tests available to check the order of co-integration of different series. However, one of the earliest test Augmented Dickey Fuller (ADF) used in this study, which presented by Dicky and Fuller (1979, 1981). D-F test pre-defined that residuals have no autocorrelation. However, ADF test changes the DF test to deal with conceivable serial correlation in the error term by including the lagged difference terms of the explanatory vairable. In such manner, Akaike Information Criterion (AIC) or Schwartz Bayesian Criterion (SBC) can be utilized as a part of the examination for determination of suitable lag length. The ADF test comprises of estimating the following equation.

$$\Delta S_t = \alpha + \beta t + \gamma S_{t-1} + \delta_i \sum_{i=1}^{k} \Delta S_{t-i} + \mu_t \quad \text{---------- (3.3.1.1)}$$

Where “t” depicts deterministic time trend;

[4] Income tax slab for the year 2015 is given in the appendix with its estimation of income tax elasticity for each slab.

ΔS_{t-1}= (S_{t-1}—S_{t-2}); ΔS_{t-i} is the lag first difference and μ_t is a white noise process.

α, β, γ and δ_i are parameters to be tested.

The null and alternative hypothesis will be given in this equation as below:

H_0: $\gamma = 1$

H_1 $\gamma \leq 1$

In case, null hypothesis is not rejected, it will mean that presence of unit root in the variable. Therefore, we have to take the difference to make the variable stationary. According to it, Variable will be integrated of order I(1).

3.3.2 Two Stage Least Square Method:

We use 2SLS method to estimate the tax buoyancies of Pakistan. We use this technique because the dependent variable error term is correlated with the independent variable error term. The basic idea behind 2SLS method is to remove endogeneity from the variables and then to estimate parameters of the model. There are two types of variables in our model: endogenous variables and exogenous variables.

Endogenous variables: Those variables that determined within the system of equations, which represent the true world. Endogenous variable are also known as dependent variable.

Exogenous Variables: Variables, which determined from outside the system. We have treated all our independent variables as exogenous.

When the variables is endogenous, it will correlated with disturbance term and make the OLS estimates biased. In our model to estimate the tax buoyancy both the variables tax

revenue (TR) and tax base (TB) are endogenous. The model below is identified simultaneous equation model.

$lnTR_i = \alpha_1 + \beta_1 lnTB_i + u_1$ ---------- (3.3.2.1)

$lnTB_i = \alpha_2 + \beta_2 lnGDP_i + v_1$ ---------- (3.3.2.2)

We algebraically solved the each of the structural equation for one endogenous variable to obtain the reduced form. The reduced form coefficients and errors are function of the structural parameters and errors. To check this, we solve the structural model presented above. By substituting equation 2 in equation 1.

$lnTR_i = \alpha_1 + \beta_1(\alpha_2 + \beta_2 lnGDP_i + v_1) + u_1$ ---------- (3.3.2.3)

$lnTR_i = \alpha_1 + \beta_1\alpha_2 + \beta_1\beta_2 lnGDP_i + \beta_1 v_1 + u_1$ ---------- (3.3.2.4)

We see that $lnTR_i$ is the linear function of v_1, hence correlated with v_1, and the OLS estimates will become biased. If we get unique parameters from the reduced form equation then the structural equation is said to be exactly identified. If we cannot, then the structural equation is said to be over identified.

Chapter 4

RESULTS AND ESTIMATION

In this chapter, we will interpret the results of our estimation. Firstly, we have estimated the income tax slab elasticity of each slab for Pakistan for the time 1984 to 2015. In the first section, we will discuss its results. Secondly, we have estimated the buoyancy for direct and indirect taxes at disaggregated levels. In the second section, we will discuss the results of buoyancy for different taxes in Pakistan.

4.1 Income Tax Slab Elasticity of Pakistan

By using the income tax slabs data, the elasticity for each slab is estimated for each year for the period 1984-2015. Elasticity value for a particular year is estimated by taking the average of the slab elasticities. The higher coefficient of elasticity is preferable as it indicates the potential of automatic generation of tax revenue. The highest coefficient of elasticity was found to be 2.07 for the year 2010 and 2011. The lowest coefficient was found to be 0.93 for the period 1988-1991. A lower value such as a value of less than 1 indicate that as the total income increase the revenue of the government will fall. The possible reasons behind this are tax evasion or the underground economy but we will not go in detail of the reasons, as it is not in the scope of the study. The table below shows the overall elasticity and the standard deviation for each year. The graphs of slab elasticities has given in the appendix (See appendix).

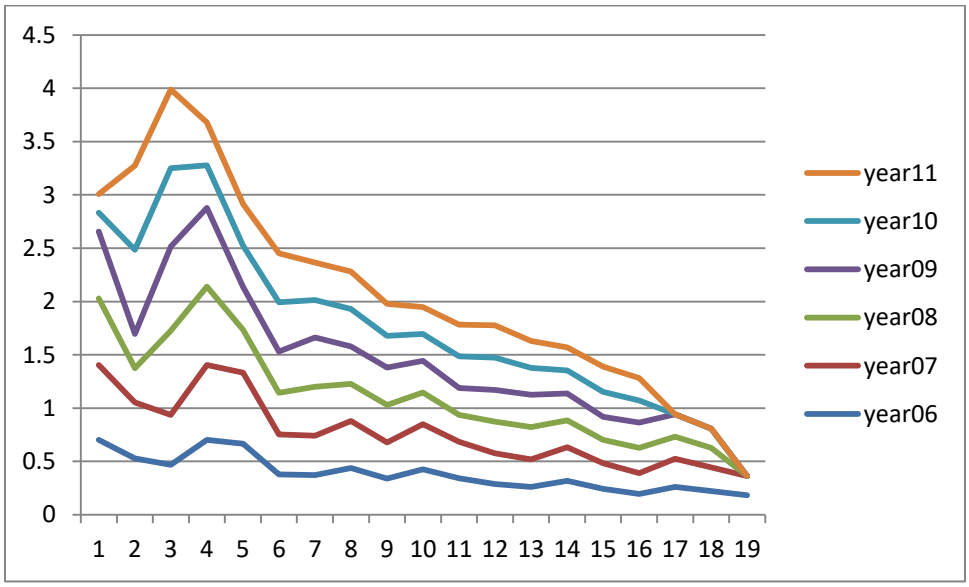
Table 4.1: Slab Elasticity of Pakistan from 1984-2015

Years	Elasticity at Slab Average	Standard Deviation (Slab Average)	Elastcity at Upper limit	Standard Deviation (Upper Limit)
1984	1.30	0.255552	1.44	0.87749
1985	1.39	0.272898	1.49	0.808895
1986	1.25	0.195182	1.59	0.360566
1987	1.25	0.195182	1.59	0.360566
1988	0.93	0.530232	1.25	0.067344
1989	0.93	0.530232	1.25	0.067344
1990	0.93	0.530232	1.25	0.067344
1991	0.93	0.530232	1.28	0.117851
1992	1.18	0.266449	1.28	0.117851
1993	1.18	0.266449	1.28	0.117851
1994	1.19	0.294151	1.28	0.117851
1995	1.17	0.198535	1.28	0.117851
1996	1.17	0.198535	1.28	0.117851
1997	1.17	0.198535	1.28	0.117851
1998	1.26	0.215086	1.29	0.354114

1999	1.29	0.255668	1.75	0.5
2000	1.29	0.255668	1.75	0.5
2001	1.50	0.074125	1.60	0.178128
2002	1.60	0.059388	1.60	0.178128
2003	1.60	0.059388	1.60	0.178128
2004	1.72	0.137175	1.61	0.212948
2005	1.65	0.138867	1.82	0.159118
2006	2.01	0.754607	2.20	0.80355
2007	2.01	0.754607	2.20	0.80355
2008	1.92	0.730388	2.11	1.039283
2009	1.92	0.730388	2.11	1.039283
2010	2.07	0.90031	2.04	1.176677
2011	2.07	0.90031	2.04	1.176677
2012	1.67	0.104952	1.84	0.220421
2013	1.69	0.158926	1.75	0.189575
2014	1.69	0.158926	1.75	0.189575
2015	1.90	0.466824	1.74	0.44608

The overall elasticity for income tax at the slab average is calculated to be 1.46 for the period 1984-2015. Similarly, overall elasticity for the period is calculated by taking the upper limit of the slab and it is found to be 1.61. There are two main tax policies implemented over the period of study. From 1984 to 2005, the taxation system was based on a fixed tax rate with a percentage tax on the income exceeding the limit. With this type of taxation policy, the elasticity is low as compared to the era after 2006. However, the elasticity is increasing within the income slabs. That is the elasticity is relatively low for the lower income group but it increases as we move towards the higher income group. The results are consistent with the progressive taxation theory. From 2006 onwards, there is no fixed tax rate but there is proportional taxation system as the income increases, the percentage tax on income also increases. In the proportional taxation system, the elasticity is relatively high but the issue is that the high elasticity is coming from the lower income group. This can be seen from the graph of slab elasticities for the period of proportional taxation given below:

Figure 4.1: Slab Elasticities of Pakistan



The trend of slab elasticities can be seen from the graph. As we seen from the graph that for all the years (i.e. 2006 to 2011), the elasticity is much higher for the lower income group as it is 4 in 2011 and as we move to the higher income group the elasticity is decreasing and it is less than 1 for the higher income group. The right side of the horizontal axis indicate high income group. High elasticity of lower income group indicates that as their income increase, the tax rate on the income rises more than the growth of income. This is against the theory of progressive taxation. If the elasticity is high for the lower income group and it is low for the higher income group, then it designates that the government is getting tax in more percentage of lower income group than the higher income group. This is the case in the proportional taxation system with no fixed tax, its elasticity is high but it is because of the higher elasticity of the lower income group. This can be a main reason behind the rising income inequality problem that the lower class is paying more percentage of their income as tax than the upper class. The basic purpose of taxation is take money from the rich and spend it on the lower class through different projects but in the proportional taxation system, it is going the other way. The government is taking more money from the lower class and there is not much projects for them so the income inequality in on the rise.

4.2 Unit root test results:

We can check stationarity of the variables by applying augmented dickey fuller test for unit root. We test the null hypothesis that the series has unit root and alternative that it has no unit root. If the null hypothesis is rejected, then the series is stationary. The result of testing unit root at level and at first difference, both the test result shows that all the

variables are stationary at first difference except Federal direct tax, which is stationary at level (Table 4.2).

Table 4.2: Variables Stationarity Results

Variables	T-Statistics	
	Level	First Difference
Federal direct taxes	-4.14 (0.010)	-5.74 (0.0001)*
Custom Duty	-1.10 (0.918)	-6.67 (0.000)*
Federal Excise Duty	-2.15 (0.506)	-5.16 (0.0005)*
Provincial Direct taxes	-0.35 (0.907)	-7.91 (0.000)*
Federal Indirect taxes	-1.20 (0.900)	-8.3 (0.000)*
Sales tax	-1.63 (0.759)	-3.89 (0.024)*
Imports	-2.03 (0.572)	-6.48 (0.000)*
Private consumption expenditure	-0.82 (0.957)	-4.31 (0.006)*
GDP at market prices	-3.02 (0.136)	-5.51 (0.0002)*
Non Agriculture GDP	-2.11 (0.528)	-5.53 (0.0002)*
Total value added of the manufacturing sector	-0.71 (0.967)	-6.26 (0.000)*

Note: p values are in parenthesis * $p<0.05$

4.3 Tax Buoyancy Results for different Taxes of Pakistan:

The estimation of direct taxes has two components. Firstly, I have estimated the buoyancy for federal income tax separately and then buoyancy for all other direct taxes is estimated.

4.3.1 Federal Income Tax:

The estimate for buoyancy of federal income tax is 1.13. It means that 1% increase in the GDP, which cause more than Unity increase in the federal income tax. This growth includes the automatic growth and the growth through the changes in tax rates and tax base. The decomposition of buoyancy shows the tax to base elasticity of 1.19 and base to GDP elasticity of 0.95. The more than unity coefficient of buoyancy is due to the higher coefficient of tax to base elasticity. It indicates that it is due to the changes in the tax base and the tax rate.

4.3.2 Other Direct Tax:

The estimate of buoyancy for other direct taxes is 0.93. It indicates that 1% increase in the GDP growth will cause less than unity increase in the other direct taxes. It can be because of the share of direct taxes has decreased from 39.3% of total revenue to 37.1% in the past year.(Economic Survey of Pakistan 2015-16) The decomposition of buoyancy shows the tax to base elasticity of 0.99 and base to GDP elasticity of 0.94.

4.3.3 Custom Duties:

Custom duty is a type of indirect tax. The buoyancy for custom duty is estimated 0.89. It shows that 1% increase in GDP will cause less than unity increase in the custom duties. The reason behind this in Pakistan is that the imports have decreased in the last year due

to the oil price shock. The effect fall in oil price can be seen through the import bill of the country, which is 4.3% less during march-July FY2016 as compared to the same period last year (Economic Survey of Pakistan 2015-16). The decomposition of buoyancy shows the tax to base elasticity of 0.83 and base to GDP elasticity of 1.08.

4.3.4 Federal Excise Duty:

The result of the present study for buoyancy of federal excise duty is 0.84. It indicates that the 1% increase in GDP will have a less than unity effect on the excise duty. The base for excise duty was value added for the manufacturing sector in the economy. There are many goods in the manufacturing sector on which there is no excise duty but it was the best available proxy to adopt. The share of federal excise duty is on the decline. The share of federal excise duty in total revenue has decreased from 30.27% in 1980-81 to 15.32% in 2015-16. It is because of the decrease in the tax rates and the replacement of federal excise duty with the sales tax on different goods to avoid double counting on taxes. The decomposition of elasticity from tax to base shows a coefficient of 0.80 and base to GDP show a value of less than unity, i.e. 1.05.

4.3.5 Sales Tax:

The estimate for buoyancy of the sales tax is 1.49. It show that 15 increase in GDP will have a larger effect than the increase in GDP on the sales tax revenue. Sales tax is the most buoyant source of revenue for the country because the reliance of the government to increase the revenue through sales tax has increased. The share of sales tax in the total revenue has increased from 9% in 1980-81 to 40% 2015-16. This is mainly because of the tax reforms in the 1990's and the introduction of General Sales Tax. The recent

changes also play an important role as the GST was increased from 16% to 17% in 2014, which also increased the share of sales tax in total revenue collection. The decomposition of sales tax from tax to base indicates a coefficient of 1.87 and base to GDP indicates a coefficient of 0.80.

4.3.6 Indirect Tax:

The results for the study of buoyancy for indirect taxes indicate that the buoyancy for indirect taxes is 0.97. It shows that a 1% increase in the GDP will have a slightly less than unity effect on the indirect taxes. It is because of the less buoyant tax structure of custom duty and excise duty. The base for indirect taxes was taken as private consumption expenditure plus the imports. The decomposition of tax to base indicates elasticity of 0.49 and base to GDP indicate elasticity of 1.98.

Table 4.3: Estimation of Tax Buoyancies at disaggregate level

Taxes	Tax to Base	Base to GDP	Buoyancy
Federal Income Tax	1.19 (0.000)*	0.95 (0.000)*	1.13
Other Direct Taxes	0.99 (0.000)*	0.94 (0.000)*	0.93
Custom Duty	0.83 (0.000)*	1.08 (0.000)*	0.89
Excise Duty	0.80 (0.000)*	1.05 (0.000)*	0.84
Sales Tax	0.80 (0.000)*	1.87 (0.000)*	1.49
Indirect Taxes	0.49 (0.000)*	1.98 (0.000)*	0.97

Note: p-value are in parenthesis * $p<0.05$

The results shows that the tax system in Pakistan is regressive for all the type of taxes. The low tax to GDP ratio (around 10.5% for 2015; Economic Survey of Pakistan 2016) of Pakistan also support this interpretation. Our findings are generally comparable with the findings of (Mohsin,2004) and (Bilquees,2004) they use the sample period of 1980-2002 and 1974-2004 respectively. However, these studies methodologies are different. We follow the same econometric methodology of Khalid et al (2014) he also applied the 2SLS method. Our results are also similar with this study results. We find very low tax elasticities because the tax system is very weak and due to presence of large amount of corruption in Pakistan.

Chapter 5

CONCLUSION

In this study, the buoyancy of different taxes has estimated by using Two Stage Least Square Method for the period 1960-2015. The buoyancy for sales tax was found to be the highest followed by the buoyancy for income tax. 1% increase in GDP will lead to more than unity increase in the revenue of sales tax and the income tax. Furthermore, Custom duty and excise duty have relatively low value of buoyancy. In indirect taxes, the main reliance is on the sales tax. As a result, it is expected that the Government will generate most of their revenue from income tax and the sales tax. As most of the taxes are not buoyant, the government would require intervening in the tax structure through changes in tax base and tax rate to meet the growing government expenditure.

The study also estimates the Elasticity of income slabs for the period 1984-2015. There were two main taxation policies used in the period. Namely, fixed and proportional tax policies. The fixed tax rate policy shows progressive elasticities from lower income group to higher income group but in the case of proportional taxation policy, the elasticity is higher than the fixed policy. However, those elasticities were coming from the lower income group. Which is not in contrast to the progressive taxation theory. Tax revenue is progressive over the year but within the income slabs, it is regressive. This is a very interesting result of the study that as we move from lower income groups to higher income group in the proportional tax with no fixed rate the elasticity of the slabs decreases. This may cause the income inequality to rise in the country as the lower

income group is paying higher percentage on their additional income as compared to higher income group. The results of both the objective indicate that the people who file the tax return and pay their income tax pay more on their additional income as compared to the people who do not file their return and pay only the indirect taxes. The indirect taxes are less buoyant as compared to the income tax slab elasticities. So overall, the tax return filers are worse off as compared to the non-filers.

Policy Implications:

In order to increase the revenue generation in Pakistan, following recommendations proposed by this study:

- On the basis of analysis of past data, government should prefer to adopt the fixed basic amount of tax plus a percentage of the amount exceeding the minimum limit policy as the results show that this kind of tax policy results in lower difference in income elasticity between different income groups. Thus lower the income inequality.
- Federal government must established the well-equipped database for the tax payers, all provincial governments recognized the potential sources of tax payers and put them in the documented form. It is possible to track down those who are evading tax.
- Control measure ought to be set up to check conceivable frauds and corruption. The tax collection staff must be trained and motivated to carry out their job more effectively.
- Stringent penalties should be given to people who evade and avoid tax payments; this will discourage tax evasion and tax avoidance.

REFERENCES:

Ahmed, M. A. (1997). Elasticity and Buoyancy of Revenues and Expenditure of Federal Government. *Pakistan Economic and Social Review, 35*(1), 43-56.

Bilquees, F. (2004). Elasticity and Buoyancy of Tax System in Pakistan. *The Pakistan development Review*, 73-93.

Chaudhary, M. A., & Hamid, A. (2001). Rescource Mobilization and Tax Elasticities in Pakistan. *Pakistan Economic and Social Review*, 25-48.

E, S. (2004). Reported incomes and marginal tax rates, 1960-2000: Evidence and policy implications. *Tax policy and Economy*, 117-173.

Fatima, Mahnaz & Ahmed.(2001). Political Economy of Fiscal Reforms in the 1990's, Pakistan Development Review, 503-518.

Feige, E. L., & McGee, R. T. (1993). Sweden's Laffer Curve: Taxation and the Unobserved Economy. *The Scandinavian Journal of Economics*, 499-519.

Feldstein, M. (1995). Behavioral Responses to Tax Rates: Evidence from the tax reform act of 1986. *The American Economic Review*, 170-174.

Giertz, S. H. (2010). The Elasticity of Taxable Income during the 1990's: New estimates and sensitivity analysis. *Southern Economic Journal*, 406-433.

Gillani, S. F. (1986). Elasticity of Federal Taxes in Pakistan. *The Pakistan Development Review*, 163-174.

Goolsbee, A. (2000). What Happens When You Tax the Rich. *The American Economic Review*, 352-372.

Heijman, W. J., & Van Ophem, J. A. (2014). Willingness to pay tax, The Laffer curve revisited for 12 OECD countries. *The Journal of Socio-Economics*, 714-723.

Heim, B. T. (2009). The effect of recent tax changes on taxable income: Evidence from a new panel of tax returns. *Journal of policy analysis and management*, 147-163.

Kazman, S. (2014). *Exploring the Laffer Curve: Behavioral Responses to Taxation.* University of Vermont.

Lindsey, L. B. (1988). Did ERTA Raise the Share of Taxes Paid by Upper-Income Tax Payers? Will TRA86 be a repeat/. *Tax Policy and the Economy*, 131-160.

Long, J. E. (1999). The Impact of Marginal Tax Rates on Taxable Income:Evidence from State Income Tax Differentials. *Southern Economic journal*, 855-869.

Mahnaz, F., & Masood, Q. (2001). Political economy ofof fiscal reforms the 1990's. *The Pakistan Development Review*, 503-518.

Mansfield, C. Y. (1972). Elasticity and Buoyancy of a Tax System: A Method Applied tp Paraguay. *International Monetory Fund*, 425-466.

Mukarram, F. (2001). Elasticity and Buoyancy of Major Taxes in Pakistan. *Pakistan Economic and Social Review*, 75-86.

Muriithi M K, E. M. (2003). Tax Reforms and Revenue Mobilization in Kenya. *AERC*.

Nutahara, K. (2011). Laffer curves in japan. *journal of japenase and international economics*, 56-72.

Samwel, K. C., & Isaac, M. K. (2012). Elasticity and Buoyancy of Tax Components and Tax Systems in Kenya. *research Journal of Finance and Accounting*.

Shrani, S. (2015). Pakistan's Taxation Crisis.

Trabandt, M., & Uhlig, H. (2011). The Laffer Curve Revisited. *Journal of Monetary economics*, 305-327.

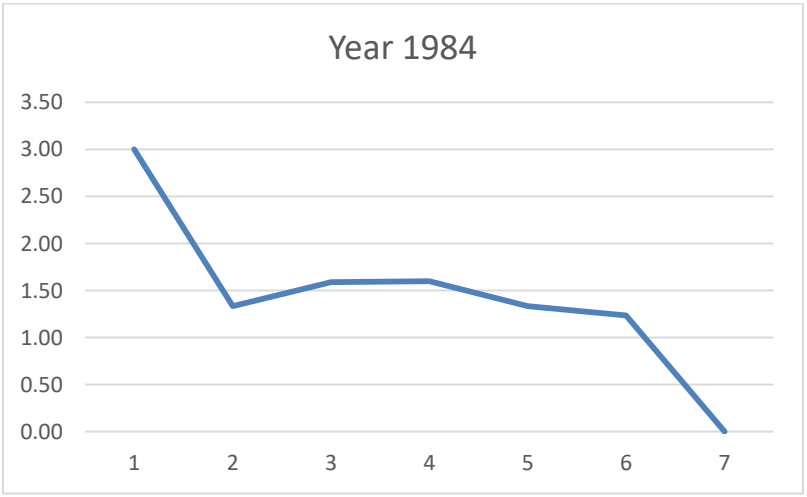
Viqar, A., & Amjad, R. (1984). The Management of Pakistan's Economy. *UGC Monograph Series in Economics*.

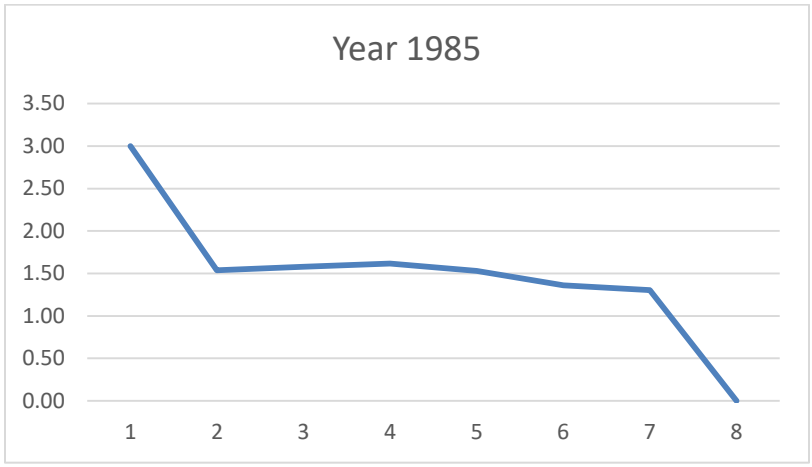
Yousuf, M., & Huq, S. M. (2013). Elasticity and Buoyancy of Major Tax Categories: Evidence from Bangladesh and its Policy Implications.

Appendix

2015											
Income tax slabs											
Lower limit	Upper limit	Fixed rate	Deduction	Percentage tax rate	Slab Average	Average tax	Average Tax rate	Marginal Tax	Marginal Income	Marginal Tax rate	Slab Elasticity
Less than 400,000		0	0	0%	0			-			
400,000	500,000	0	400,000	2%	400,000	0.00	0.00	0.00	400000.00		
500,000	750,000	2,000	500,000	5%	500,000	2000.00	0.00	2000.00	100000.00	0.02	5.00
750,000	1,400,000	14,500	750,000	10.00%	750,000	14500.00	0.02	12500.00	250000.00	0.05	2.59
1,400,000	1,500,000	79,500	1,400,000	12.50%	1,400,000	79500.00	0.06	65000.00	650000.00	0.10	1.76
1,500,000	1,800,000	92,000	1,500,000	15.00%	1,500,000	92000.00	0.06	12500.00	100000.00	0.13	2.04
1,800,000	2,500,000	137,000	1,800,000	17.50%	1,800,000	137000.00	0.08	45000.00	300000.00	0.15	1.97
2,500,000	3,000,000	259,500	2,500,000	20.00%	2,500,000	259500.00	0.10	122500.00	700000.00	0.18	1.69
3,000,000	3,500,000	359,500	3,000,000	22.50%	3,000,000	359500.00	0.12	100000.00	500000.00	0.20	1.67
3,500,000	4,000,000	472,000	3,500,000	25.00%	3,500,000	472000.00	0.13	112500.00	500000.00	0.23	1.67
4,000,000	7,000,000	597,000	4,000,000	27.50%	4,000,000	597000.00	0.15	125000.00	500000.00	0.25	1.68
Above 7000,000		1,422,000	7,000,000	30%	7,000,000	1422000.00	0.20	825000.00	3000000.00	0.28	1.35

Slab Elasticity Graphs of Pakistan:

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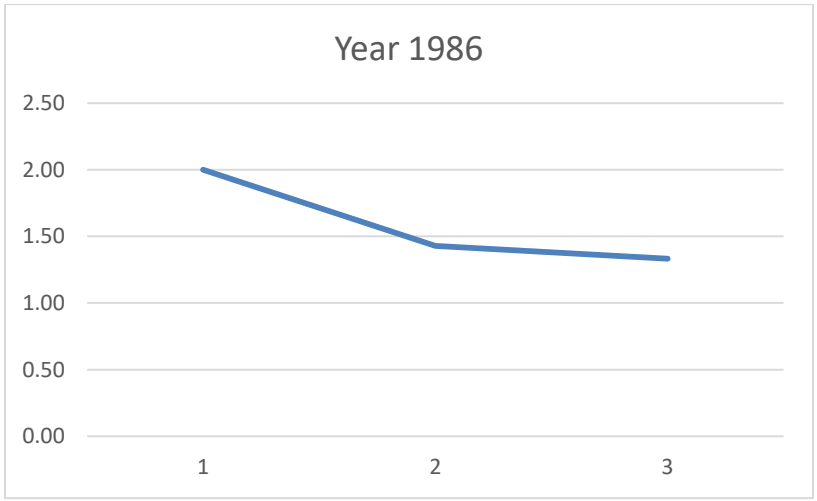
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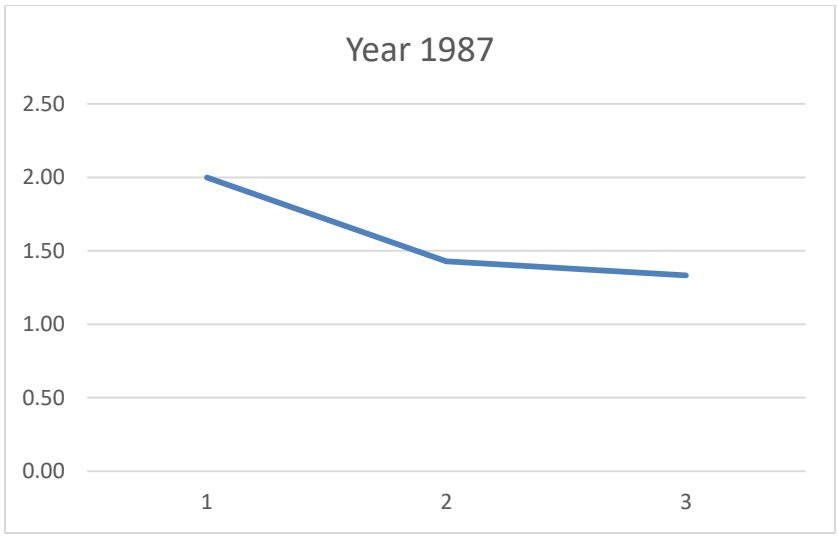
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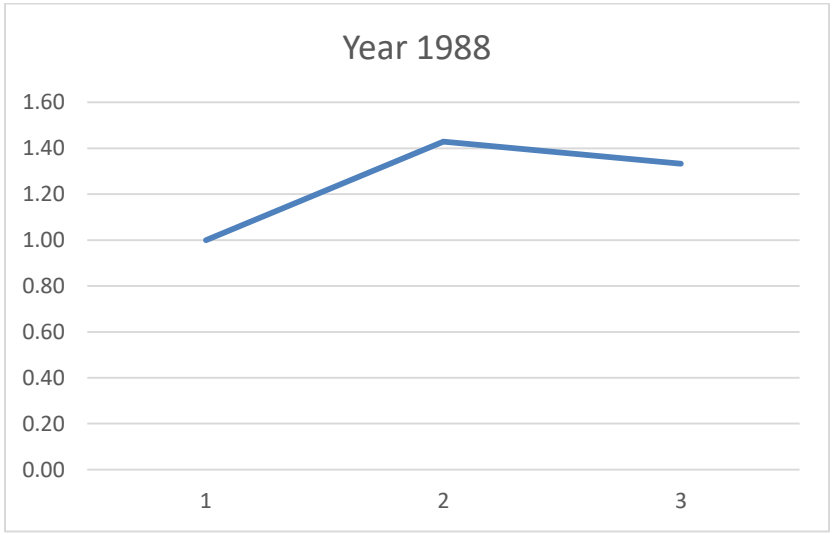
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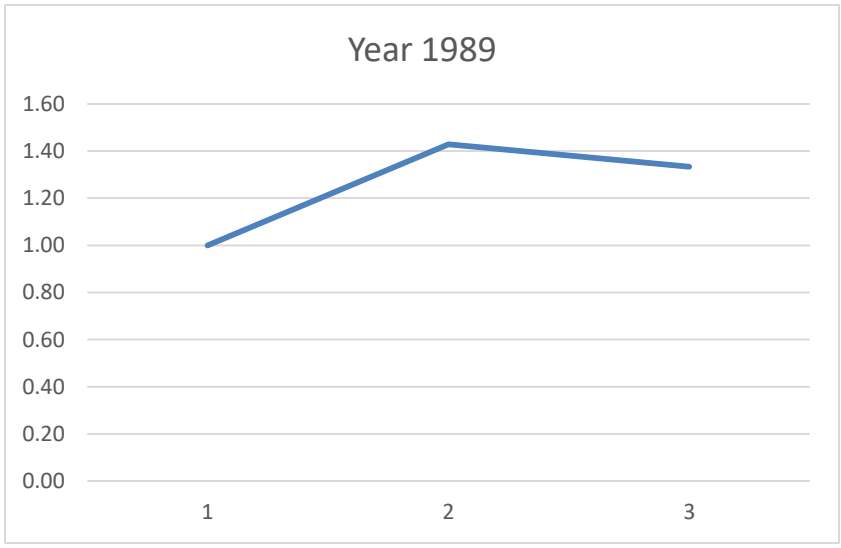
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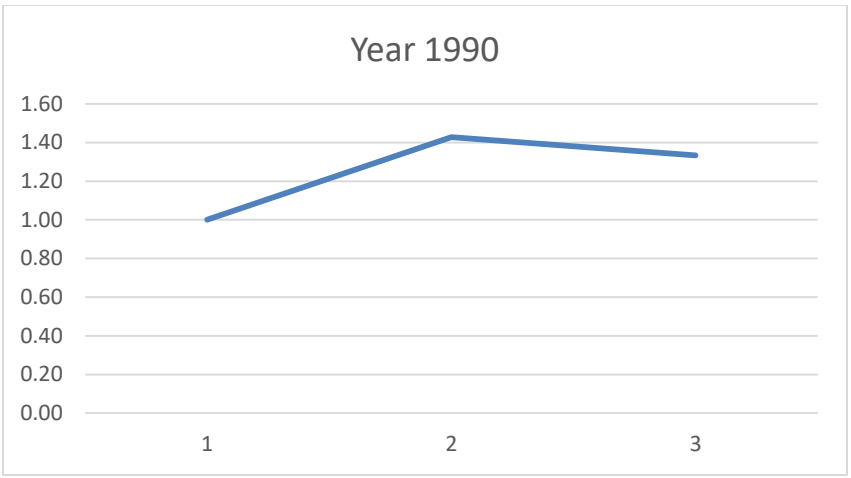
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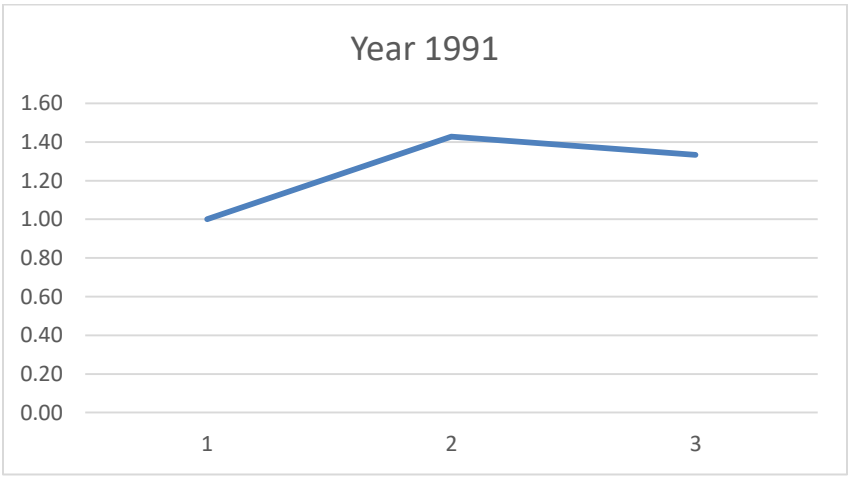
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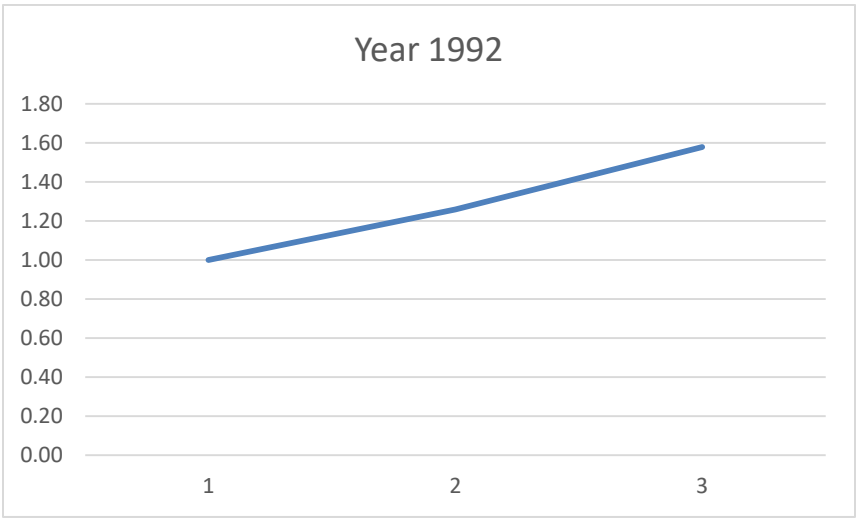
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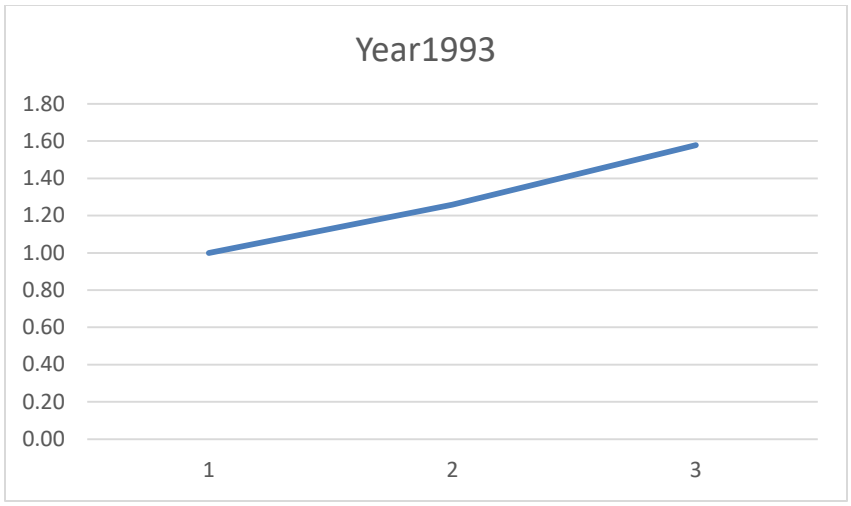
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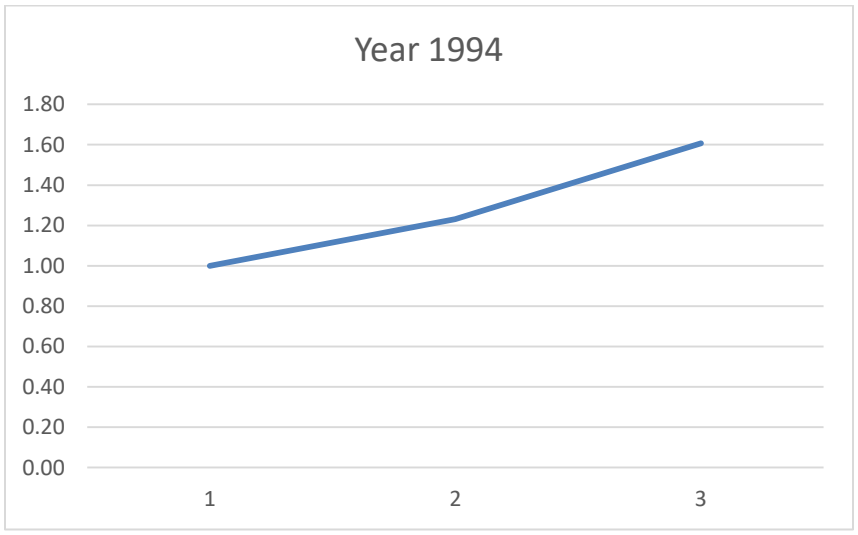
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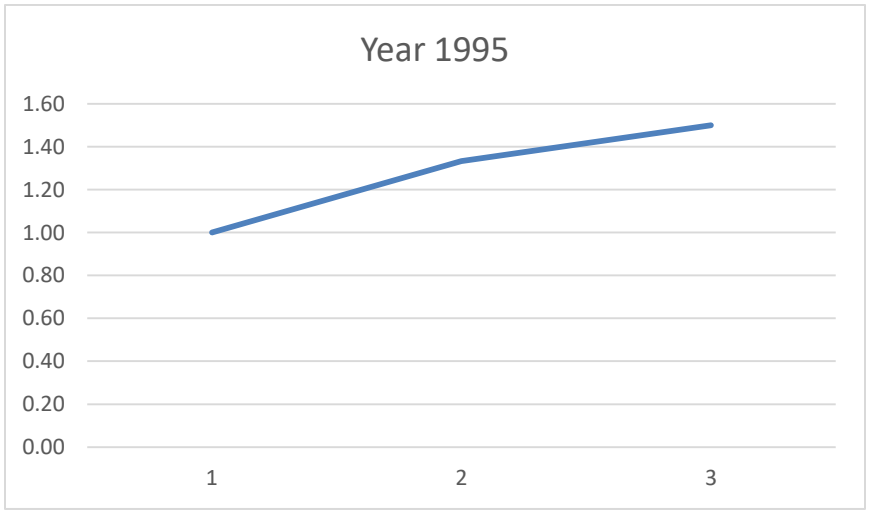
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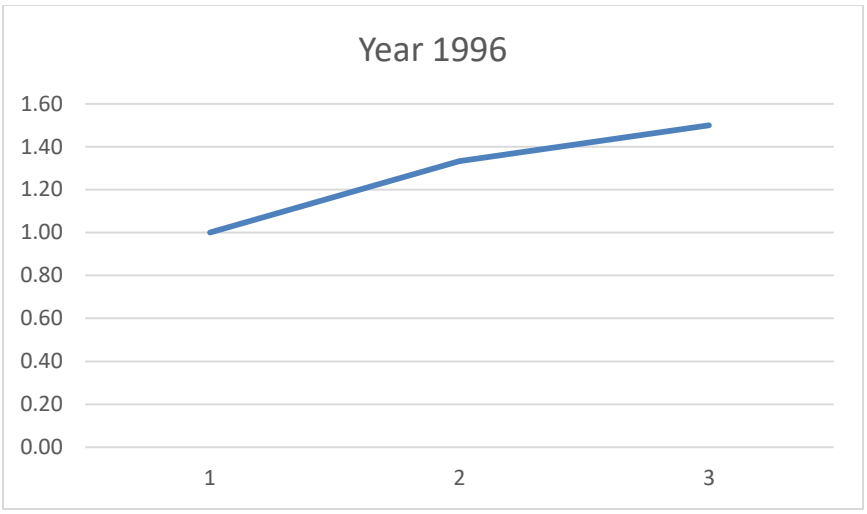
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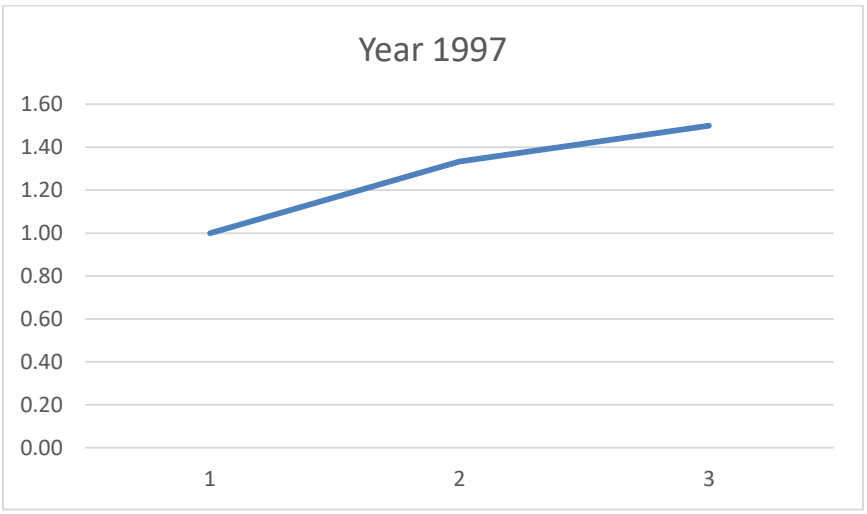
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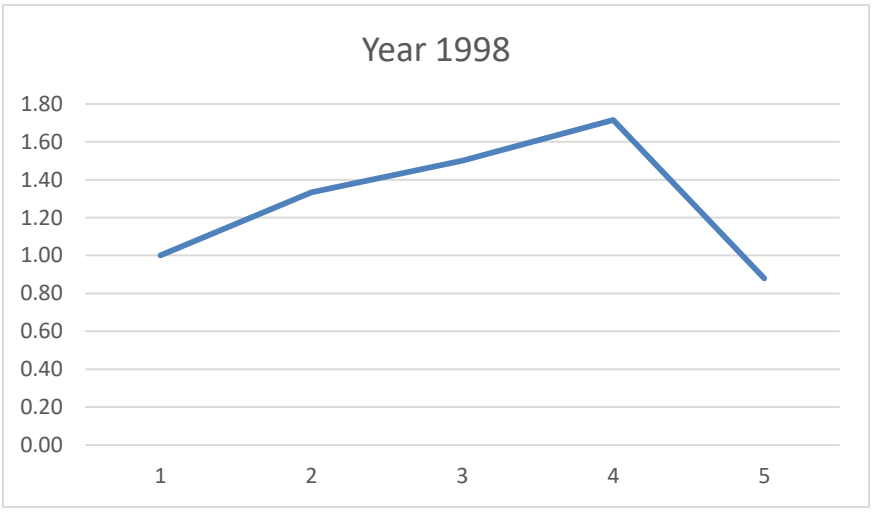
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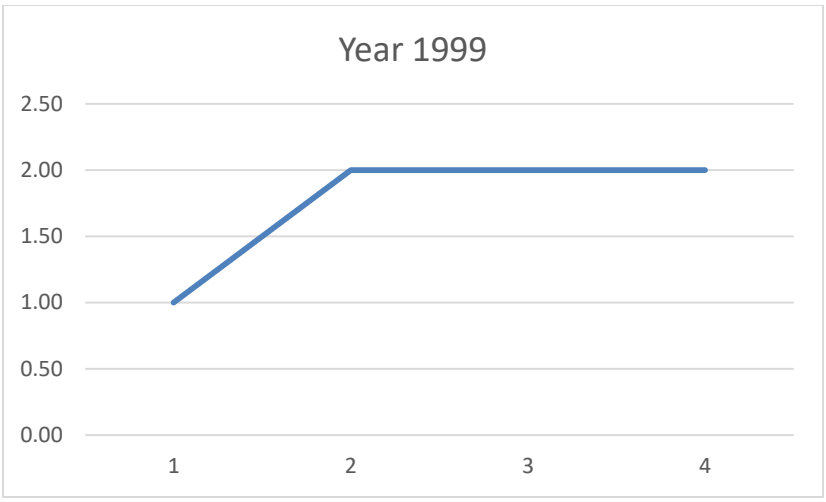
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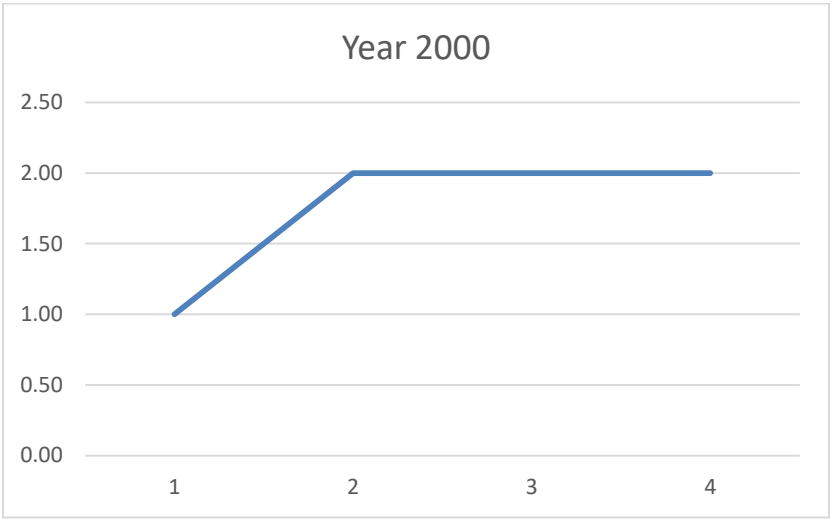
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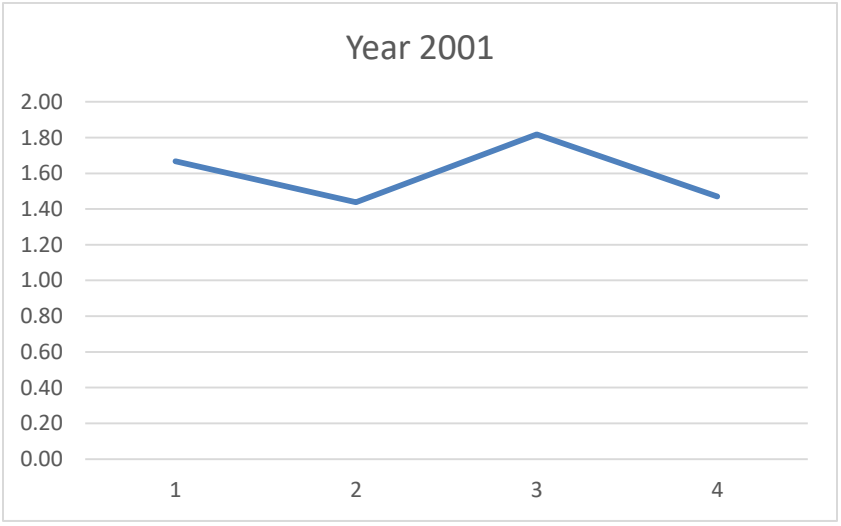
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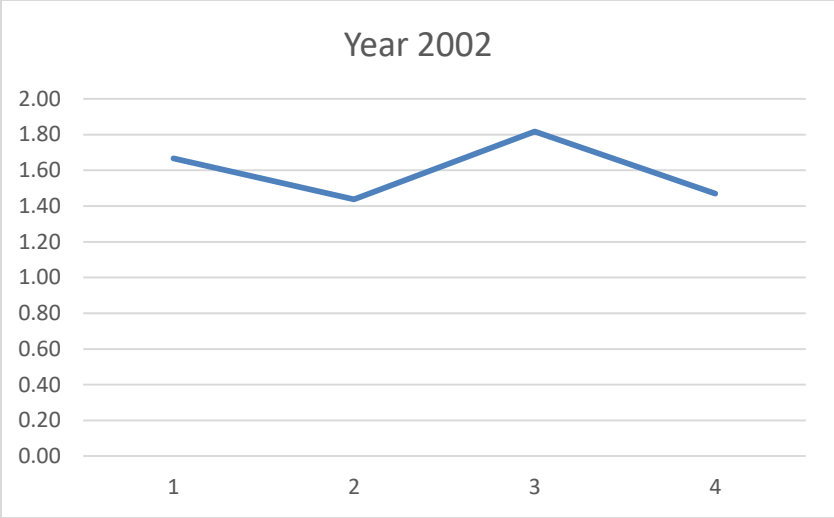
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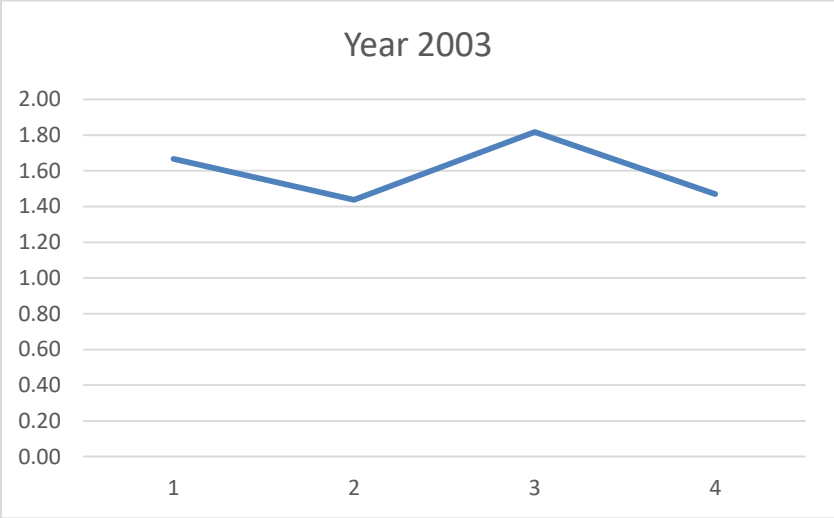
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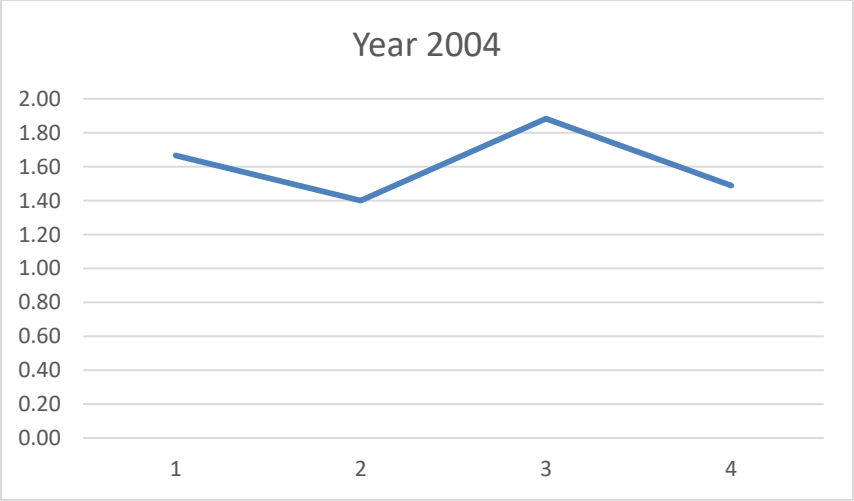
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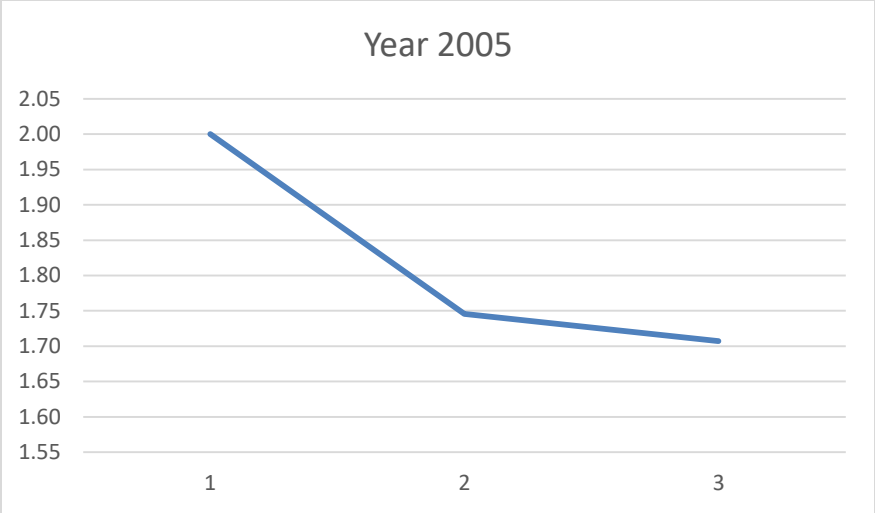
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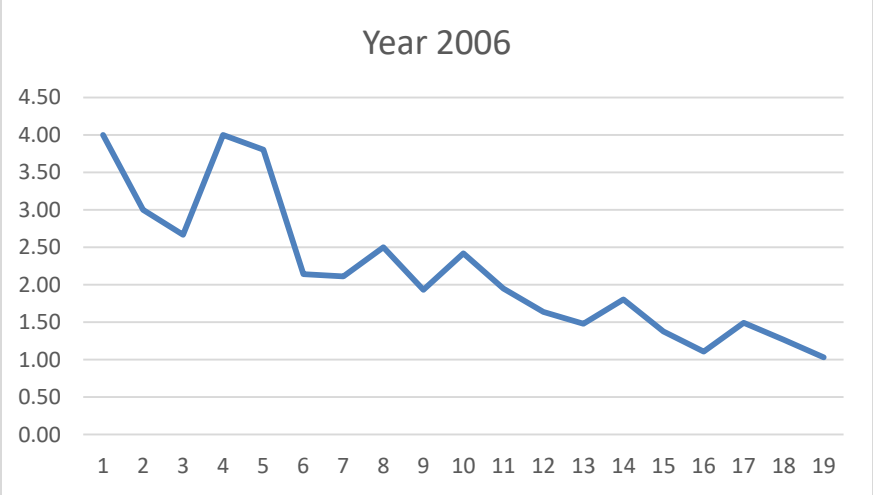
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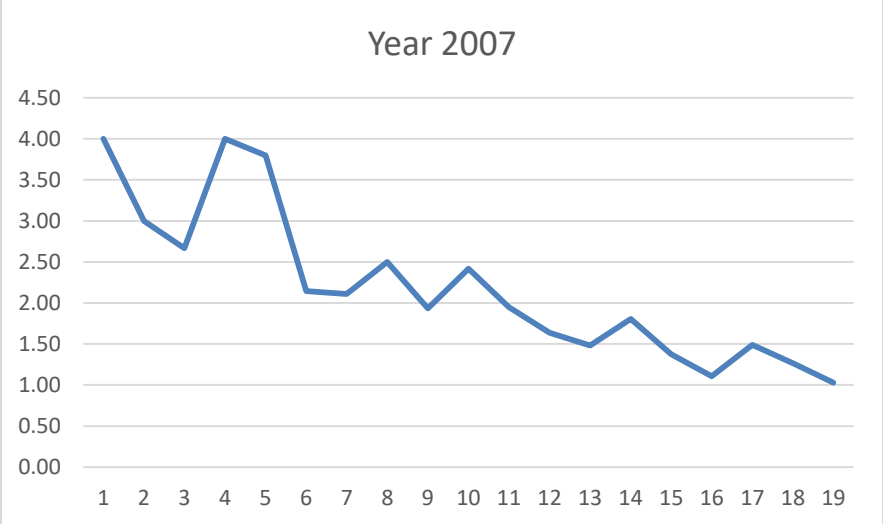
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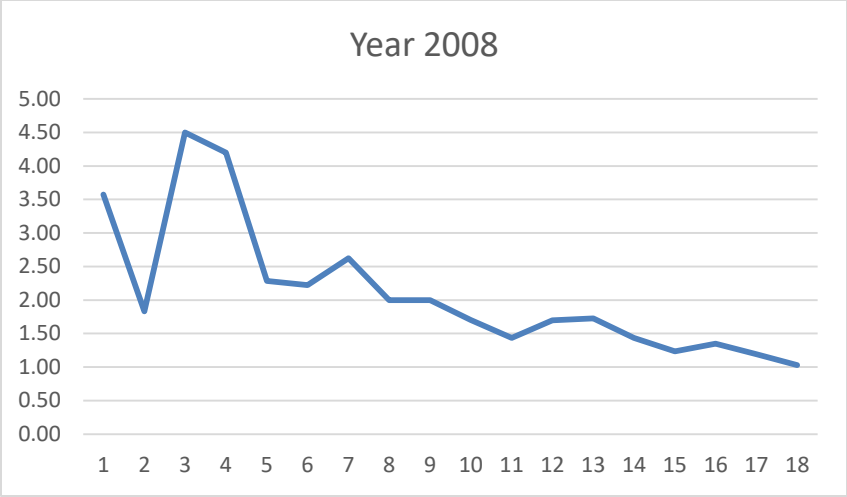
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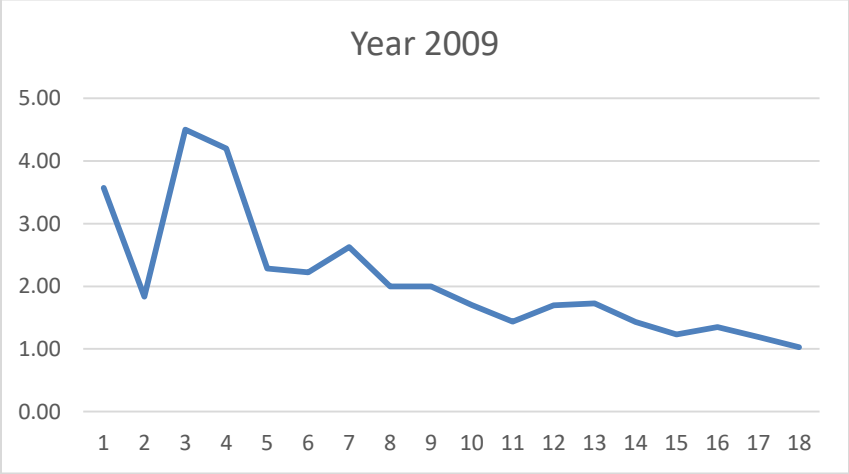
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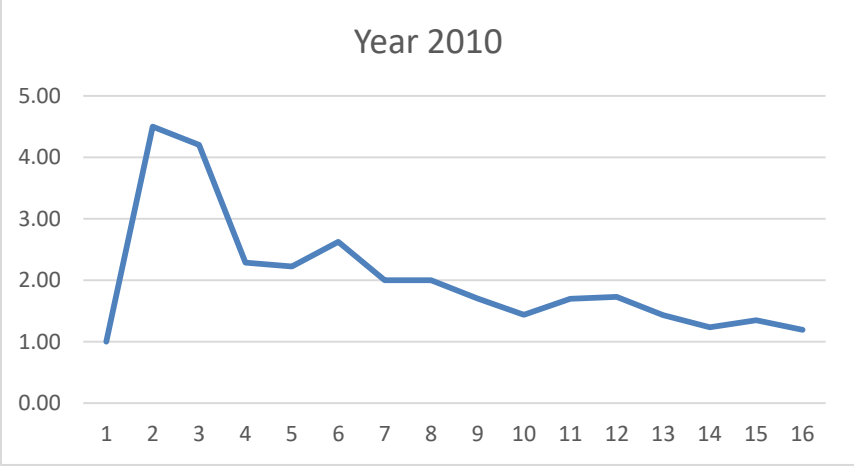
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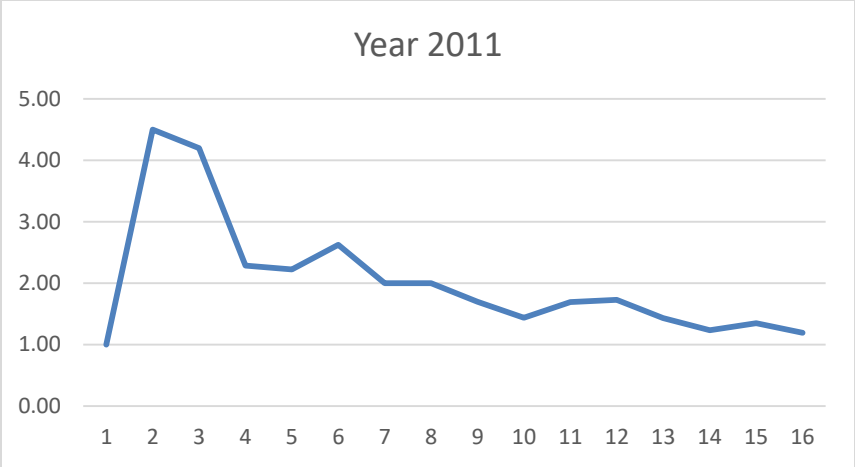
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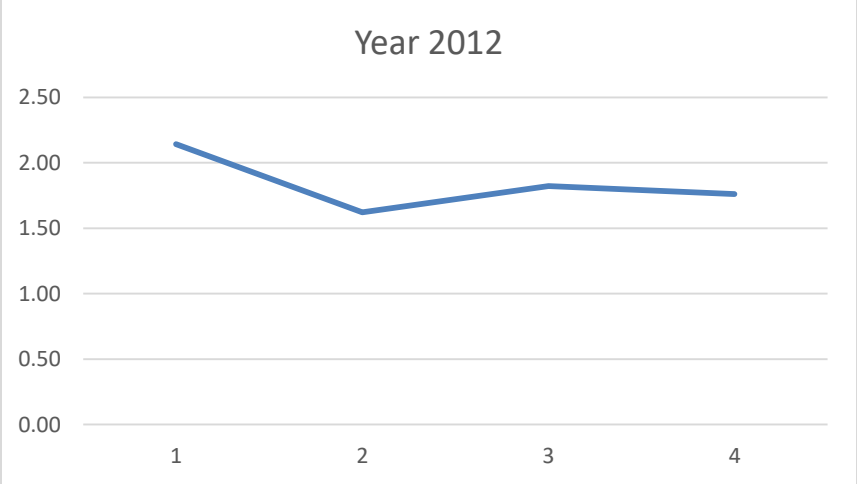
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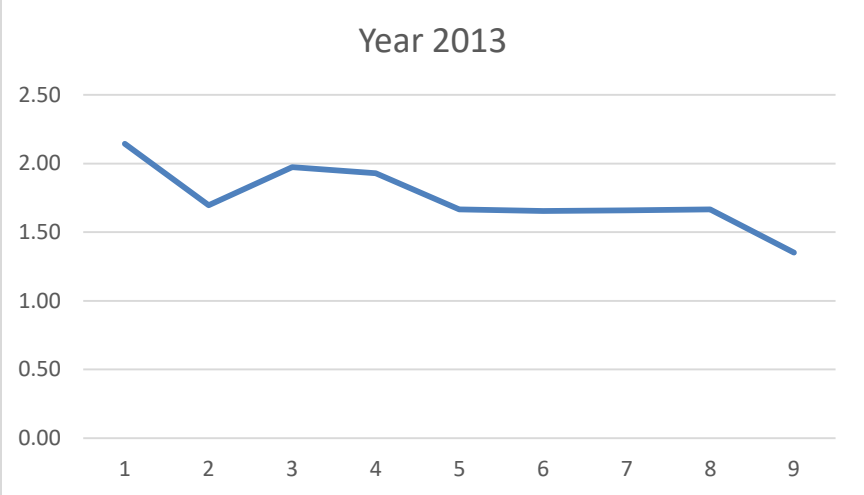
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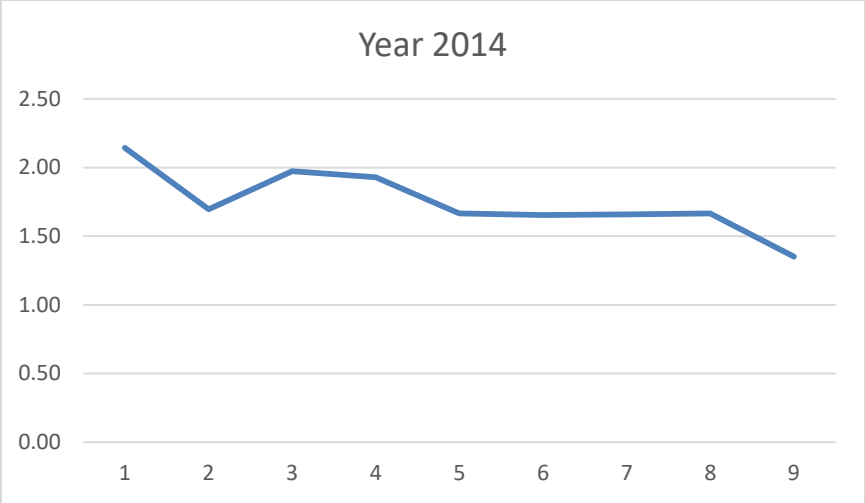
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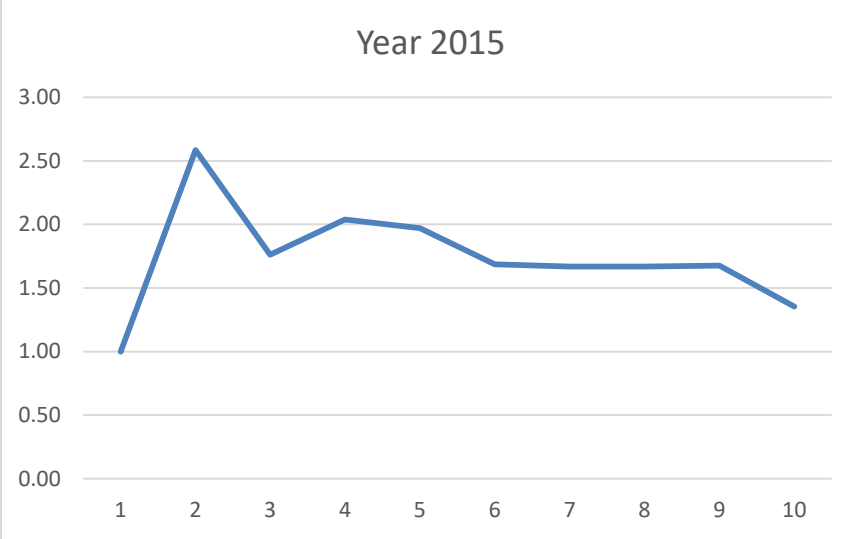
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