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AN EVALUATION OF THE IMPACT OF CORRUPTION ON TAX MORALE AND TAXATION IN PAKISTAN

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ABSTRACT

The present study investigates how corruption has affected tax compliance, tax revenues and how different categories of tax have been affected by corruption in Pakistan from 1984 to 2018. As for as corruption and tax compliance is concerned results show that corruption, higher tax burden, inflation and external debt all reduce the tax compliance. Corruption reduces all tax revenues but some taxes are affected greater. The taxes which involve communication among tax authorities and taxpayers (e.g. international trade taxes) are more vulnerable to corruption than other forms of taxation. As for as corruption is concerned results show that public investment increases the corruption while a higher ratio of direct taxes, higher female labour force participation and better governance reduce the corruption. Findings infer that the government need to limit the use of administrative power to impede economic activity in order to reduce the chance of rent-seeking. Good governance plays an important role in reducing corruption. Ensuring institutional checks on authority, having transparency in public investment and improving law and order can build public confidence on the government.

Keywords: Public investment, private investment, property rights, informal economy, tax revenue
JEL Codes: H26, E02, H21, H71

I. INTRODUCTION

Corruption is described as a dishonest or criminal offense committed by a person or organization entrusted with the power to exercise illicit benefit or abuse for one's personal gain. Corruption may involve many activities including bribery and fraud, although it may also include legal procedures in many countries. The World Bank has recognized that corruption is the major problem to economic and social development. People in various sectors such as private and government abuse their power to make money. As a result, rule of law is compromised and it deteriorates the institutional foundation on which the economic growth depends. Even the issue of corruption has now become a major agenda at international conferences, business meetings and educational conferences. It is also a major electoral issue in many countries. Not only developing countries are experiencing corruption developed nations are also facing this challenge. South Korea and Somalia are in top position in corruption[4]. In developing countries corruption has spread to the extent that it has become part of their daily lives. From public institutions to private organizations corruption is everywhere. The community has accepted it as an inevitable practice. The political and economic environment of the country has lot to do with corruption. Ineffective and vague terms encourage individuals to bribe to expedite bureaucratic practices. Lack of professional ethics, limited laws that classify corruption as a criminal offense, the way it is investigated and laws are endorsed are also the main cause of spreading corruption. When laws are not implemented effectively it encourages people to pursue their corrupt practices. Lack of accountability, lack of transparency in transactions and lack of political-will all contribute to corruption.

Corruption adversely affects the long term social, political and economic development of the society and it jeopardize the rule of law. It also causes problems such as citizens can lose confidence in their leaders and distort the

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incentives of the market and have a negative effect on financial flows and therefore effecting wealth creation. Corruption increases the level of public investment at the expense of private investment. Fiscal distortion caused by corruption reduces the ability of the state to redistribute the funds allocated to low income households, pensions and other essential services effectively. In developing countries there are many public projects which are never completed effectively and efficiently, in fact, people use those projects for personal enrichment (Sahithi, 2018). Due to the corruption developing countries cannot collect sufficient amount of tax revenue (Brondolo et al., 2008). Corruption creates mistrust in the system and it brings down the morale of a taxpayer thus leading to noncompliance (Andreoni et al., 1998; Timmons and Garfias, 2015). Countries that have high level of corruption also have larger shadow economies. Since corruption creates distrust on the bureaucracy and it discourages entrepreneurs from starting business in the official economy. All countries are facing the challenge of corruption and unofficial economy to some extent. There are many studies which discuss the link between corruption and shadow economy. No matter what, the fact is that corruption and shadow economy both negatively affect social well fare. When the size of the informal economy grows this means many businesses are not registered in the official economy and thus government tax revenue is further decreased (Herzfeld, 2005; Khan et al., 2021).

Pakistan, is one of the most corrupt country. Lack of governance and lack of will to take actions against corruption is the key factor for corruption to increase. In Pakistan, 80% of taxes are collected from poor people while rich people only contribute 5%. On the other hand, rich people enjoy a luxurious lifestyle but when it comes to contribute to the collective good they use their power to avoid taxes. Pakistan's low tax base, its limited ability to collect taxes, and the low national rate of tax compliance points to the need for better tax administration. According to the Pakistan Economic Survey 2017-18, tax collection in Pakistan is lowest among all emerging economies. Total tax revenue is just 13.7 percent of GDP. Eighty percent of tax revenue is collected from indirect taxes through fuel, utilities and mobile communication services. Indirect taxes directly affect the poor and middle class people as it increases cost of goods and services thus it becomes hard for poor people to meet even their everyday needs. As describe above that corruption not only reduces the investment and growth but also reduces the government revenue by raising the debt burden. How government revenues are affected by corruption and which type of revenues are most affected? This will also provide an insight how tax evasion can be reduced and tax compliance can be increased which will ultimately raise tax revenue. Regarding Pakistan, there is limited literature on the impact of corruption on individual taxes rather than total tax revenue. This study would be of great value to the government, revenue officials and businesses and it will serve as a resource to other researchers as well. Therefore, the key objective of the present study is to find out the effects of corruption on government revenue generation for Pakistan from 1984-2018. Other specific objectives include to analyze the factors that determine the corruption and to examine the effects of corruption on tax compliance.

The study is divided into five sections. Section one discusses introduction which includes significance, objectives and contribution of study. Section two describes a brief review from previous literature. Section three discusses formulation of the model and description of the variables. The empirical results are presented in the subsequent sections, and the conclusion and suggested policies are given in the last section.

II. EMPIRICAL REVIEW

This section provides a brief review from previous literature. We have subdivided this section according to our objectives.

II.I. DETERMINANTS OF CORRUPTION

Chen et al. (2015) examined that the amount of public investment and the size of the government both significantly raise corruption whereas law enforcement and schooling are most significant factors to reduce corruption. Liu and Feng (2014) found that countries that depend more on direct taxes have lower levels of corruption than those who depend more on indirect taxes. Countries who have complicated tax system have higher tendency towards corruption compared to countries with less complicated tax system. Dong and Torgler (2013) examined the causes and consequences of corruption. He examined a positive relationship among economic growth and corruption. Corruption enlarge the income inequality and distort public expenditures. Orlega et al. (2010) analyzed that freedom and economic development lower the incidence of corruption moreover, corruption and democracy has nonlinear relationship. Duasa (2008) indicate that two department, police and immigration, have high chances of corruption. Personal debt payments also positively contribute to high propensity of corruption among government servants. Seldadyo (2006) analyzed that political liberation serves to reduce corruption moreover strong rule and law reduce

corruption. Dictatorship of an Ethnic group of a country generate an unequal access to power. Barr and Serra (2010) analyzed that political instability lead to increase corruption.

II.II. CORRUPTION AND TAX COMPLIANCE

Bourgain et al. (2018) analyzed the impact of corruption on tax compliance. Corruption offers a means of evading tax requirements. Baum and Gupta (2017) show a significant negative correlation between corruption and taxes as percent of gross domestic product. Moreover, influence of corruption on revenue is mediated by weak compliance. Rosid et al. (2018) examined the relationship between the incidence of corruption and underreporting behavior in Indonesia. They showed that corruption has a destructive effect on tax morale and tax revenue. Leonardo (2016) et al. examined the trust in government institution and the willingness to pay tax. Tax morale is affected by individual's trust in government institution on the output side. Binaj (2015) examined that greater corruption level is associated with greater evasion of tax or to the larger size of the underground economy. Carvalho and Pacheco (2014) and Acconcia and Martina (2003) examined that trust in authorities and punishment to tax evader are correlated and are important factor of securing tax compliance. Schneidder (2007), Ruge (2010), Dhere (2006) and Johnson (1998) examined that increasing the burden of social security and taxation combined with labor force regulation are the driving force of shadow economy. Jahnke (2017) analyzed that petty corruption significantly breaks tax morale. Corruption affects the tax administration's credibility as well as tax payer morale.

II.III. CORRUPTION AND TAX REVENUE

Bahadur (2018) showed an inverse relationship among tax evasion, tax revenue and economic development. Increase in tax evasion decrease the value of tax revenue. Arif (2018) and Samimi et al. (2010) addressed the effects of corruption and institutions on tax revenue collection. They showed that governance and corruption affect tax revenue positively. If the governance is good it reduces corruption and results in efficiency. Folayan and Adeniyi (2018) analyzed the effects of tax evasion on tax revenue generation in Oyo state. They find that avoidance of taxes has negative effect on government revenue collection furthermore perceived government corruption can make respondent to evade tax. Epaphra (2017) and Hunaday et al. (2015) analyzed that there is more corruption in indirect taxes than direct taxes. Tax revenue declines as tariff rate increases. Countries with more stable economies and small agriculture sector, tax to GDP ratio is higher. Raza and Naqvi (2016) showed that in the long run there is a statistically substantial and negative correlation between total tax revenue and tax avoidance. Hashem (2014) show that overall corruption has increased the government expenditure on defense and general public services whereas expenditures on health care, recreation services, and education has declined. Corruption negatively effects the trustworthiness of governance. Amin et al. (2014) analyzed that both direct taxes and indirect taxes are vulnerable to corruption. Corruption is main obstacle in raising tax revenue for both type of taxes. Cooray (2013) shows corruption increases public debt therefore reducing tax revenue. Higher level of corruption means the higher level of public debt and higher future tax burden. If corruption reduces government debt will automatically fall and reduce the size of unofficial economy. Imam and Jacobs (2007) analyzed the effect of corruption on different taxes in the Middle East. International trade taxes appear to be more affected by corruption than any other type of taxes. Indirect taxes such as property taxes and sales taxes, corruption does not affect significantly. On the contrary to direct taxes, it is easy to raise indirect taxes as there are less constraints. Hwang Jinyoung (2002) and Ajaz (2010) explains that one possible explanation for the link between observed corruption and distortion in government revenue is that corrupt government finds it easier to take bribes in some activities than others.

II.IV. LITERATURE GAP

We conclude from the literature review that there are lot of cross country studies available to assess the effect of corruption on tax revenue while literature is limited regarding the components of tax revenues. Therefore, we contribute by examining how the corruption affects individual components of tax revenues so we can identify the categories which are less affected by corruption for a comprehensive tax policy.

III. FORMULATION OF THE MODEL

In this section we have explained the econometric model related to our objectives following the previous literature. Next, we have discussed description of variables.

III.I. DETERMINANTS OF CORRUPTION

Numerous studies try to analyze the determinants of corruption; Theobald (1990) and Shabir and Anwar (2007) divide the determinants of corruption into economic and non-economic determinants. The present study follows the

frame work of Liu and Feng (2014). The corruption is described by the econometric model as a function of numerous variables. The model looks like this;

$$COR_t = \alpha_\circ + \alpha_1 PI_t + \alpha_2 TS_t + \alpha_3 FDI_t + \alpha_4 LFPR_t + \alpha_5 GOV_t + \mu_t$$

$\alpha_1 > 0, \alpha_2 < 0, \alpha_3 > 0, \alpha_4 < 0, \alpha_5 < 0$

COR is corruption index (0 -10), low to high corruption.
PI is Gross fixed capital formation by the public sector as a % of GDP.
TS is the tax system represented by the ratio of direct to indirect taxes.
FDI is the investment made by foreign investors in the reporting economy as a % of GDP.
LFPR is the ratio of female to male labor force participation
GOV is governance index (0-10), weak to strong governance.

III.II. CORRUPTION AND TAX COMPLIANCE

Various studies have identified the determinants of tax compliance. Some studies have incorporated the corruption as a determinant of tax compliance while others not. The present study follows the frame work of Gaspareniene et al. (2016). We provide a description of the econometric model used to analyze tax compliance as a function of various variables. Following is the model;

$$TC_t = \gamma_\circ + \gamma_1 COR_t + \gamma_2 TB_t + \gamma_3 INF_t + \gamma_4 DEBT_t + \upsilon_t$$

$\gamma_1 < 0, \gamma_2 < 0, \gamma_3 < 0, \gamma_4 < 0$

TC is tax compliance determined by dividing the shadow economy's size by GDP.
COR is corruption index (0-10), low to high corruption
TB is tax burden measured as the ratio of tax rate to GDP
INF is inflation measured as change in consumer price index
DEBT is external debt stock to gross national income

III.III. CORRUPTION AND TAX REVENUE

There are many studies available that find the determinants of tax revenue eg., [Teera, 2003; Tanzi and Zee, 2000; Imam and Jacobs, 2007]. The current study follows the outline of Imam and Jacobs (2007). The current analysis differs from Patrick et al. (2007) in that we have looked at how institutional variables affect individual taxation. Based on the argument we explain econometric model that describes the ratio of tax to GDP as a function of multiple variables. The model is as follows;

$$TR_t = \beta_0 + \beta_1 COR_t + \beta_2 GOV_t + \beta_3 TO_t + \beta_4 INF_t + \beta_5 YPC_t + \varepsilon_t \qquad \beta_1 < 0, \beta_2 > 0,$$

$\beta_3 > 0, \beta_4 < 0, \beta_5 > 0$

TR is tax revenue as a ratio to GDP. (We will use overall tax revenue as well as revenue generated from direct and indirect taxes).
COR is corruption index (0-10), low to high corruption
GOV is governance index (0-10), weak to strong governance.
TO trade openness measured as the ratio of exports and imports to GDP.
INF is inflation measured as change in consumer price index.
YPC is per capita income

III.IV. DESCRIPTION OF VARIABLES

Corruption is commonly described as the use of public power for personal benefit violating the declared rules. The commonly used indicators of corruption include Corruption Perceptions Index (CPI) by Transparency International, Control of Corruption index by International Country Risk Guide (ICRG), the Transparency International's Bribery Index (BPI) and World Bank Corruption Control Index (CC). We have used the corruption index of ICRG which lies b/w 0-10 where smaller the value the lesser the corruption. Gross fixed capital formation also known as fixed investment is used for public investment. It includes improving land, buying machinery and equipment, constructing roads, railways, schools, hospitals and industrial buildings and so on. The direct to indirect tax ratio provides insight into the tax system.. Tax system is called less complex when this ratio increases. Foreign direct investment is measured by net FDI inflows. It includes equity capital, reinvestment of earning, other long-term capital and short-term capital as shown in the balance of payments. The labor force participation is the proportion of the 15-64-year-old population which is actively working. We have used the ratio of female to male labour force participation. Regarding governance International Country Risk Guide (ICRG) provides the data. We have used rule of law as an indicator of governance which lies between 0-10 where smaller the value the lower the governance. Tax compliance

refers to the fulfillment of all tax obligations as specified by the law. It is hard to correctly measure taxpayer compliance. Currently, there are no uniform standard methods for measuring tax compliance. Tax compliance indicator can be simplified as the size of the underground economy/GDP, the smaller the ratio the higher the level of tax compliance for taxpayers. Tax rate as a percent of GDP represent tax burden. Inflation represents the impact of macroeconomic policies. Inflation is calculated by taking the yearly growth rate of consumer price index (CPI). External debt consists of publicly guaranteed and privately nonguaranteed long term debt, IMF credit and short term debt. Tax revenue refers to total tax revenue (both direct and indirect) as a ratio of GDP. Due to unavailability of complete data of direct taxes we have used direct tax in aggregate while for indirect tax we have used sales tax and customs duty. We use the measure of trade openness as sum of exports and imports as a ratio to GDP. A reliable indicator of economic growth is per capita income. The real GDP per capita is measured in constant local currency prices. Yearly time series data of Pakistan from 1984 to 2018 has been used. The data of trade openness, inflation, labour force participation ratio, foreign direct investment, per capita income and external debt is taken from World Development Indicators (WDI). The data of tax revenue and public investment is taken from State Bank of Pakistan (SBP). The data of corruption and governance is taken from International Country Risk Guide (ICRG). The tax compliance data is sourced from Mughal and Schneider (2018). To test the stationarity of variables we have used Augmented Dickey Fuller test. The results of ADF test lead towards Johnson Co-integration.

Table 1: Summary of Variables

Variable Name	Symbol	Description	Unit	Source
Corruption	COR	Corruption index	Index (0 -10) low to high corruption	ICRG[5]
Governance	GOV	Rule of law	Index (0-10) Weak to strong governance	ICRG
Trade Openness	TO	Sum of exports and imports as a share to GDP	Index	WDI
Inflation	INF	Inflation is calculated by taking the annual growth rate of consumer price index (CPI).	Index	WDI
Tax revenue/Tax Burden	TR	Total tax revenue as a percentage of GDP. Also direct to indirect tax revenue.	Percentage of GDP	SBP
Tax system	TS	Ratio of direct to indirect taxes		SBP
Labor force participation ratio	LFPR	Ratio of female to male labor force participation		WDI
Tax Compliance	TC	Size of shadow economy as a % of GDP.	Percentage of GDP	Mughal and Schneider (2018)
External Debt	DEBT	Total external debt stock to gross national income.	Percentage of GNI	WDI
Foreign Direct Investment	FDI	Net inflows from foreign investors in the reporting economy.	Percentage of GDP	WDI
Public Investment	PI	Gross fixed capital formation by the public sector as a % of GDP.	Percentage of GDP	SBP
Per Capita Income	YPC	GDP is divided by midyear population to calculate per capita income.	Million rupees	WDI

IV. Results and Discussion

This section discusses the results. First we discuss the descriptive statistics of the data. Then we discuss the results of unit root test and at last we give the results of Johnson co-integration. Before estimation it is obligatory to examine the reliability of the data. Commonly used measures of data analysis are the measure of central tendency and the measure of dispersion. The median and mode are used as the measure of central tendency. While measures of dispersion include standard deviation, quartile, deviation and mean deviation. Jarque-Bera is used to check

[5] Internal Country Risk Guide

whether the series is normally distributed. Results of the descriptive statistics are described in the table below. Results show that mean and median of almost all the variables are same, it also provides symmetry of the data. Results in the table show low variability because the values of the standard deviation are small. Jarque-Bera results show that we fail to reject the null hypothesis of normal distribution.

Table 2: Descriptive Statistics

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Jarque-Bera (prob)
COR	9.611121	9.503378	10.04295	8.174184	0.980910	0.202186
FDI	10.32740	10.30136	12.73195	6.472964	1.816659	0.364557
LFPR	16.93054	16.05700	23.91900	8.680000	4.558806	0.405862
GOV	4.565476	5.000000	3.916667	1.000000	0.717668	0.074493
INF	7.978010	7.692156	20.28612	2.529328	3.949641	0.086678
PI	12.02641	11.63976	14.36241	10.05582	1.284482	0.292324
TR	1.014799	0.711158	2.704767	0.256570	0.725023	0.077705
TC	26.89200	26.98000	41.37000	14.27000	6.667046	0.596576
TO	33.25836	33.33360	38.90949	25.30623	3.455883	0.425428
DEBT	38.79729	42.48099	54.69302	22.92760	10.34611	0.179345
YPC	10.30638	10.29571	12.10182	8.517198	1.168198	0.285052
STR	3.184831	4.006788	4.833894	0.965389	1.252687	0.148295
DTR	3.141694	3.214809	4.333614	1.816706	0.848413	0.232758
CTR	3.070449	2.049970	6.350987	0.155377	2.060346	0.134691

The Augmented Dickey Fuller Test (ADF) is used for stationary. We test null hypothesis of unit root against the alternative. Results are described in the table below. Results show that we refute the unit root at the first difference, which is the null hypothesis. Each and every variable is integrated of order one. The null hypothesis cannot be ruled out at level.

Table 3: Results of Unit Root

Variable	Level		1st Difference		Order of Integration
	Intercept	Trend & Intercept	Intercept	Trend & Intercept	
TS	0.879(2.95)	2.294(3.54)	5.981*(2.95)	5.883*(3.54)	I(1)
TO	1.675(2.95)	2.779(3.54)	6.967*(2.95)	7.019*(3.54)	I(1)
TC	2.394(2.95)	2.368(3.54)	6.621*(2.95)	6.547*(3.54)	I(1)
TR	1.750(2.95)	1.222(3.54)	7.213*(2.95)	7.355*(3.54)	I(1)
INF	2.491(2.95)	2.444(3.54)	7.054*(2.95)	7.016*(3.54)	I(1)
GOV	2.027(2.95)	2.541(3.54)	4.268*(2.95)	4.223*(3.54)	I(1)
LFPR	1.0082(2.95)	3.34(3.54)	8.169*(2.95)	8.117*(3.54)	I(1)
COR	2.657(2.95)	2.607(3.54)	6.067*(2.95)	5.84*(3.54)	I(1)
PI	0.028(2.95)	2.170(3.54)	4.883*(2.95)	4.838*(3.54)	I(1)
DEBT	0.797(2.95)	2.793(3.54)	4.551*(2.95)	4.488*(3.54)	I(1)
FDI	2.840(2.95)	2.793(3.54)	3.85*(2.95)	3.81*(3.54)	I(1)
YPC	0.08(2.95)	2.71(3.54)	5.20*(2.95)	5.09*(3.54)	I(1)
DTR	1.51(2.95)	2.58(3.54)	3.74*(2.95)	3.66*(3.54)	I(1)
STR	1.42(2.95)	1.94(3.54)	6.37*(2.95)	6.49*(3.54)	I(1)
CTR	0.27(2.95)	1.84(3.54)	5.31*(2.95)	5.26*(3.54)	I(1)

Note: * shows the significance at 5 % level of significance.

IV.I. DETERMINANTS OF CORRUPTION

$$COR_t = \alpha_\circ + \alpha_1 PI_t + \alpha_2 TS_t + \alpha_3 FDI_t + \alpha_4 LFPR_t + \alpha_5 GOV_t + \mu_t$$

We have employed maximum eigenvalue as well as trace statistics to identify the co-integrating vectors. The results of both are given below:

Table 4: Trace Statistics

Lags interval (in first differences): 1 to 1				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.733472	120.0543	95.75366	0.0004
At most 1 *	0.662767	76.41913	69.81889	0.0135
At most 2	0.572810	40.54873	47.85613	0.2035
At most 3	0.199041	12.48133	29.79707	0.9138
At most 4	0.122668	5.157118	15.49471	0.7919
**MacKinnon-Haug-Michelis (1999) p-values				

Table 5: Maximum Eigen Statistics

Hypothesized		Max-Eigen	0.05	
No. of CTE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.733472	43.63512	40.07757	0.0191
At most 1 *	0.662767	35.87041	33.87687	0.0285
At most 2 *	0.572810	28.06739	27.58434	0.0434
At most 3	0.199041	7.324216	21.13162	0.9401
At most 4	0.122668	4.318722	14.26460	0.8243
**MacKinnon-Haug-Michelis (1999) p-values				

According to the results Trace test shows two co-integrating equations at the 5% level of significance. Thus null hypothesis of one co-integration equation is rejected against the alternative of two co-integrating equations. Similarly, Maximum Eigenvalue test indicates three co-integrating equations therefore we reject our null hypothesis.

Table 6: Long Run Results: Dependent Variable: COR

Variable	Coefficient	Standard Error	T Statistics
PI	1.166289	0.31391	3.7153*
TS	-0.172991	0.01683	-10.2786*
FDI	0.251281	0.11683	2.1508**
LFPR	-0.395798	0.08374	-4.7265*
GOV	-1.462353	0.21302	-6.8448*

Note: * shows the significance at 1% while ** shows significance at 5 % level of significance.

Results show that rise in public investment increases the corruption. Public investment involves the corruption primarily in the construction of infrastructure. Government investment requires a lot of money which gives officers great opportunities to abuse taxpayer money if there is no oversight. Our findings are consistent with economic theory. Sohail and Cavill (2008) and Golden and Picci (2005) discovered a strong positive association between corruption and public works.

As the proportion of direct to indirect taxes reflects the tax system, results show that higher the ratio of direct taxes lower the corruption will be. Direct taxes consist of mostly the income and wealth of the taxpayer's thus direct tax has a higher degree of transparency and it is less likely to transfer the tax burden to other (Tanzi and Zee, 2000). On the contrary indirect taxes are built in the prices of products and services and consumers don't know how much tax they are paying. Indirect taxes are more complex and possibility of corruption is higher (Barreto and Alm, 2003). Our findings are consistent with existing literature, it is generally thought that by raising direct taxes tax system will help to reduce the level of corruption (Fisman and Gatti, 2002; Gunardi, 2008). Countries that depend more on direct taxes are less likely to be corrupt. (Liu and Feng, 2014).

According to our findings there is positive relation between foreign direct investment and corruption. When foreign direct investment increases corruption also increases. Normally, foreign direct investment is linked to huge infrastructure projects and privatization plans thus the possibility of corruption is higher. Our findings relate to existing studies like Heba (2013) and Liu and Xia (2015) assertion that FDI enters particularly corrupt regions in order to get around environmental regulations by bribing officials such as making China a "pollution paradise". There are also contradictory findings that explain that foreign direct investment reduces the corruption. Foreign investors will be more cautious to invest in places with high corruption since it raises the cost and unpredictability of investment (Felip Larrain and Jose Tavares, 2004). A one % increase in the female to male labor force participation

reduces the corruption by 0.39 percent. Swamy et al. (2001) found that tendency of women toward corruption is less as they are risk averse and even more honest than men. Studies show that risk of being caught is also a contributing factor for women to be more honest. The studies conducted by Transparency International's Global Corruption Barometer consistently show that possibility of women to accept bribe is very low as compared to men. Our findings are relevant to existing studies (Breen, 2015; Torgler, B. &. Valev, N.T., 2004). Results show that as governance improves corruption will reduce. Good governance creates a healthy balance between society, businesses and the state. Good governance increases the profitability of entrepreneurs which reduces the informal sector by lowering the level of corruption. Our findings are consistent with economic theory (Saha, 2014; Ajaz and Ahmed, 2010).

Table 7: Short Run Results: Dependent Variable: DCOR

Variable	Coefficient	Standard Error	T Statistics
ECT(-1)	-0.131807	0.06404	-2.05807**
D(COR(-1))	0.030558	0.11970	0.25528
D(PI(-1))	0.257141	0.17129	1.50122
D(TS(-1))	0.012970	0.00973	1.33345
D(FDI(-1))	0.036176	0.08689	0.41635
D(LFPR(-1))	0.109398	0.04558	2.40028**
D(GOV(-1))	0.146545	0.10446	1.40284
R-squared	0.498641	Adj. R-squared	0.358261
Sum sq. resids	0.872155	S.E. equation	0.186779
F-statistic	3.552070	Akaike AIC	-0.310570

Note: ** shows the significance at 5 % level of significance.

A negative error correction term is shown by the short run estimates which confirms the co-integration among the variables. The feedback coefficient is -0.13, which means that the disequilibrium of the previous year, which was around 13%, is remedied in the current year.. Only labour force participation ratio is significant in the short run which shows that higher female labour force participation positively affect the corruption contrary to long run result. R-squared explain 49 % variations in the model.

IV.II. CORRUPTION AND TAX COMPLIANCE

$$TC_t = \gamma_\circ + \gamma_1 COR_t + \gamma_2 TB_t + \gamma_3 INF_t + \gamma_4 DEBT_t + \upsilon_t$$

To decide the number of co-integrating vectors we have utilized both trace statistics and maximum eigenvalue statistics. The results of both are displayed below:

Table 8: Trace Statistics

Lags interval (in first differences): 1 to 2				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.729719	82.26283	69.81889	0.0037
At most 1	0.510394	40.39750	47.85613	0.2086
At most 2	0.244295	17.54455	29.79707	0.5998
At most 3	0.183899	8.581211	15.49471	0.4055
At most 4	0.062881	2.078248	3.841466	0.1494
**MacKinnon-Haug-Michelis (1999) p-values				

Table 9: Maximum Eigen Statistics

Hypothesized		Max-Eigen	0.05	
No. of CTE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.729719	41.86533	33.87687	0.0045
At most 1	0.510394	22.85295	27.58434	0.1798
At most 2	0.244295	8.963344	21.13162	0.8354
At most 3	0.183899	6.502962	14.26460	0.5495
At most 4	0.062881	2.078248	3.841466	0.1494

According to the results Trace and Maximum Eigenvalue test indicate one co-integrating equation therefore we reject our null hypothesis in both cases.

Table 10: Long Run Results: Dependent Variable: TC

Variable	Coefficient	Standard Error	T Statistics
COR	-2.451765	0.86363	-2.8389**
TB	-0.311103	0.06780	-4.5885*
INF	-0.598954	0.20068	-2.9846**
DEBT	-0.676417	0.10730	-6.3039*

Note: * shows the significance at 1% while ** shows the significance at 5 % level of significance.

A one percent increase in corruption reduces the tax compliance by 2.451 percent. Corruption results in non-compliance of taxpayer's as it changes their behavior. Individuals and companies pay bribe to avoid taxes and they feel there is no need to comply with tax regulation (Andreoni et al., 1998; Timmons and Garfias, 2015). Our findings are consistent with economic theory like Alm et al., 2016 and Gauthier and Goyette, 2014 found that corruption has negative effect on tax compliance. According to our results tax burden and tax compliance are inversely related. The high tax burden creates opportunities for corruption. Increasing tax burden usually leads to tax avoidance because financial actors in the markets prefer to escape the tax burden and higher public deficit due to reduced tax revenues increase the size of the shadow economy (Masud et al., 2014; Barreto and Alm, 2003). One percent increase in inflation reduces the tax compliance by 0.598 percent. Rise in inflation lead to low purchasing power and, of course, as inflation grows people have less motive to pay their taxes. They try to evade taxes, the morale to give tax become low. Our findings are relevant with economic theory (Fishlow and Friedman, 1991). One percent increase in external debt stock reduce the tax compliance by 0.676417 percent. To fulfill the financial needs government often take foreign debt. If external debt is not used productively where it will not generate economic activity and produce enough cash flow, then country will face negative consequences. Higher debt burden will raise the tax burden where people try to evade tax lowering the tax compliance. Our findings relate to existing studies like (Canache et al., 2019).

Table 11: Short run Results: Dependent Variable: DTC

Variable	Coefficient	Standard Error	T Statistics
ECT(-1)	-0.799439	0.23823	-3.35581*
D(TC(-1))	0.121294	0.24198	0.50126
D(TC(-2))	0.124067	0.20411	0.60785
D(COR(-1))	9.364365	5.95147	1.57345
D(COR(-2))	7.382393	5.28534	1.39677
D(TB(-1))	-0.385527	0.20207	-1.90787***
D(TB(-2))	-0.269151	0.16848	-1.59752
D(INF(-1))	0.229333	1.03503	0.22157
D(INF(-2))	-1.101420	1.07346	-1.02605
D(DEBT(-1))	-0.958257	0.56256	-0.56256
D(DEBT(-2))	-0.744083	0.37481	-1.98525**
R square	0.494412	Adj. R-squared	0.175093
F-statistic	1.548333	Akaike AIC	6.319187

Note: * shows the significance at 1% while ** at 5 % level of significance. *** shows the significance 10% level of significance.

The table shows the results of Error Correction Model. The short run co-efficient estimates point out that the error correction term (EC_{t-1}) is negative which provides the evidence of co integrating relationship among the variables. The feedback coefficient is -0.79, which means the disequilibrium from the prior year is corrected by roughly 79% in the current year. The higher tax burden and debt burden reduce the tax compliance in the short run. R-squared explain 49 % variations in the model.

IV.III. CORRUPTION AND TAX REVENUE

$$TR_t = \beta_0 + \beta_1 COR_t + \beta_2 GOV_t + \beta_3 YPC_t + \beta_4 TO_t + \beta_5 INF_t + \varepsilon_t$$

We take total tax revenue (TR) and its components; custom revenue (CTR), sale tax revenue (STR) and direct tax revenue (DTR)

Table 12: Long Run Results: Dependent Variables: Different categories of tax revenue

Independent Variables	Total Tax Revenue (TR)	Indirect Tax Revenue		Direct Tax Revenue (DTR)
		Customs Tax Revenue (CTR)	Sales Tax Revenue (STR)	
COR	-4.566280*	-5.883941*	-4.395886**	-0.94778*
GOV	1.848528*	0.658556**	2.058673*	0.301471*
INF	-0.442696**	-0.593228*	-1.235673*	-0.02680
TO	0.580670**	0.396277*	0.800733	0.017365
YPC	0.39415	2.825205*	1.757681*	0.251566**

Note: * shows the significance at 1% while ** at 5 % level of significance.

Corruption reduces all forms of taxation but some taxes have a greater impact than others. Results show that taxes that often require communication among tax collectors and taxpayers (such as international trade taxes) are more vulnerable to corruption than other forms of taxation. Corruption in custom management is a big problem in many developing countries. Corruption in customs not only affects tax revenue but also capacity to trade. As for as sales tax is concerned sales tax frauds causes significant tax revenue loss. As businesses are not properly documented many of the wholesalers and retailers are not registered there is no way government can make them liable for sales tax unless they are registered. Direct taxes are affected by corruption when tax payers don't report his/her income accurately. Our findings are relevant with economic theory (Imam and Jacobs, 2007; Awan and Hannan, 2014; Abed and Gupta, 2002; Hwang, 2002; Samimi et al., 2012; Hunaday et al., 2015; Amin et al., 2014; Keen, 2003; Audi and Ali, 2017; Audi and Ali, 2017; Audi et al., 2021; Audi and Ali, 2016; Audi et al., 2021; Audi et al., 2021; Audi et al., 2021; Haider and Ali, 2015).

One percent increase in governance quality increases total tax revenue by 1.848528 percent, custom revenue by 0.658556 percent, sale revenue by 2.058673 percent and direct revenue by 0.301471 percent respectively. If government is efficient it can collect more tax revenues by improving tax system. Better governance, better taxation, better macroeconomic policies and other discretionary tax measures can achieve better tax to GDP ratio. Our findings are consistent with other studies (Arif and Rawat, 2018; Ajaz and Ahmed, 2010). Results show that inflation reduces the total tax revenue, customs revenue and sales revenue. Higher inflation indicates lower purchasing power as a result there is less economic activity in the market thus affecting tax revenue. Our findings are relevant with economic theory, the revenue from taxes is lower as macroeconomic environment gets worse (Ali and Naeem, 2017; Ali, 2011; Ali, 2015; Ali and Rehman, 2015; Ali, 2018; Ali and Bibi, 2017; Ali and Ahmad, 2014; Ali and Audi, 2016; Audi and Ali, 2018; Ali and Audi, 2018).

One percent increase in trade openness increases total tax revenue by 0.580670 percent, and customs revenue by 0.396277 percent, sale revenue by 0.800733 percent and direct tax revenue by 0.017365 percent respectively. Through trade openness government can raise more tax revenue as it leads to more economic activity (Keen and Ligthart, 2002). On the contrary Pritchett and Sethi (1994), have argued that trade openness reduces trade restrictions thus leading to decrease in tax revenue collected from custom duties.

Results show that increase in per capita income has no effect on total tax revenue. Revenue from direct taxes, sales taxes, and customs are all positively correlated with per capita income. When per capita income increases it leads to higher levels of growth, higher capability to pay taxes and government's ability to collect taxes increases as well (Chelliah, 1971). Custom revenue increases by 2.285 percent for every one percent increase in per capita income. As per capita income increases demand for imported goods increase which increase the customs revenue. When per capita income increases consumption also increases which increase sales revenue. Increase in per capita income lead to increase in direct tax revenue. Per capita income increases the morale of people to give tax (Ajaz and Ahmed, 2010).

The short run co-efficient estimates show that the error correction term is negative providing the evidence of long run relationship between variables. The feedback coefficient of tax revenue from total taxes (DTR) is -0.10, tax revenue from customs (DCTR) is -0.29, tax revenue from sales tax (DSTR) is -0.42 and tax revenue from direct taxes (DDTR) is -0.25 indicating that the disequilibrium in the previous year is corrected by 10, 29, 42, and 25% in the current year. Corruption, inflation, trade openness and per capita income have significant affect in the short run. R-squared explain 46, 41, 47 and 41 % variations in the model respectively.

Table 13: Short Run Results: Dependent Variables: First difference of different categories of tax revenue

Independent Variables	Total Tax Revenue D(TR)	Indirect Tax Revenue		Direct Tax Revenue D(DTR)
		Customs Tax Revenue D(CTR)	Sales Tax Revenue D(STR)	
ECT (-1)	-0.107453**	-0.299464*	-0.422858*	-0.257893***
D(TR(-1))	-0.042136			
D(CTR(-1))		0.155694		
D(STR(-1))			-0.229111	
D(DTR(-1))				0.646540*
D(COR(-1))	0.231525***	-0.85377	-0.510030*	0.137285
D(GOV(-1))	-0.085076	0.195109	0.0866083	-0.087856
D(INF(-1))	0.030537	-0.057450**	0.015578	-0.010029
D(TO(-1))	0.121767**	-0.058601	-0.032581	-0.016794
D(YPC(-1))	0.563269	-4.082424**	-1.297462	-0.055001
R square	0.464328	0.419767	0.471593	0.415731
Adj. R-squared	0.314340	0.192719	0.295457	0.252136
F-statistic	3.095769	1.848804	2.677439	2.541216
Akaike AIC	0.777281	1.215789	0.271685	0.217313

Note: * shows the significance at 1 % while ** at 5 % level of significance. *** shows the significance at 10 % level of significance.

V. CONCLUSION AND POLICY RECOMMENDATIONS

This section describes a brief conclusion. We have discussed the objectives and the findings from empirical analysis. Then some policy recommendations are also discussed. Corruption is the most dangerous social evil in every part of society. Corruption is the biggest hurdle to social and economic growth. The issue of corruption has now become the main agenda of international conferences, business meetings and educational conferences. This has become a major electoral issue in many countries. Pakistan is considered one of the most corrupt countries. The key purpose of the study is to evaluate the effect of corruption on government revenue generation for Pakistan from 1984-2018. Other specific objectives include analyzing the factors that determine the corruption and to determine the effect of corruption on tax compliance. For empirical analysis we have used Johansson Co-integration. Regarding the determinants of corruption results show that public investment and foreign direct investment enhance the corruption. Constant corruption affects public investment, particularly in the construction of infrastructure. Foreign direct investment is often linked with large infrastructure projects and privatization plans so that the magnitude of the economic rents involved is substantial. Higher female labor force participation, governance and a higher ratio of direct taxes reduce the corruption. If female labor force participation increases corruption will reduce because countries with greater representation of women in the work force found that tendency of women toward corruption is less as they are risk averse and even more honest than men. By emphasizing increased accountability, maintaining transparency, and eliminating resource misallocation that is incompatible with development, the good governance approach merely aims to combat corruption. Higher the ratio of direct taxes corruption will reduce. As for as tax compliance is concerned our results show that corruption, tax burden, inflation and external debt stock reduce the tax compliance. As the tax burden increase the tax compliance will be low. Higher tax burden creates opportunities for corruption. As inflation grows people have less motive to pay their taxes. A higher external debt increases the future tax burden there by reducing the tax compliance. Regarding the impact of corruption on different tax revenues results show that corruption reduces all type of tax revenues but indirect tax revenues are affected most. Findings show that taxes that often require communication between tax administration and taxpayers (such as international trade taxes) are more vulnerable to corruption than other forms of taxation. We conclude from the above discussion that corruption reduces all type of tax revenues and tax compliance. Moreover, corruption can be reduced by improving the governance, lowering the public investment, increasing the ratio of direct taxes and encouraging the female labour force participation. Our results lead to some policy implications given below;

First, government should lessen the perception that it has administrative authority over economic activities and to lessen the likelihood of rent-seeking. Second, the ratio of direct taxes should be increased because they create less corruption as compared to indirect taxes though due to the pressure from interest group direct taxes are not easy to increase politically. Government need to make policies which encourage female participation in the workforce, this would help reduce corruption. Last, by emphasizing improved responsibility, establishing institutional restraints on authority and discretion, ensuring transparency in public investment, and enhancing law and order conditions, the

good governance approach merely seeks to combat corruption. It will build public confidence over the government thus compliance will be higher.

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