

The Impact of Revenue Gap on Economic Growth: A Case Study of Pakistan

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Abstract—This study employs auto-regressive distributed lag (ARDL) bounds approach to cointegration for long run and error-correction modeling (ECM) for short run analysis to examine the relationship between revenue gap and economic growth for Pakistan using annual time series data over the period 1980 to 2008. The short and long run results indicate that revenue gap is statistical significant and negatively effect economic growth. The significant and negative coefficient of error correction term in ECM indicates that after a shock, the long run equilibrium will again converge towards equilibrium about 10.406 percent within a year.

Keywords—ARDL cointegration, Economic Growth, Revenue Gap, Pakistan.

I. INTRODUCTION

AVAILABILITY and mobilization of revenue is the fundamental factor with which an economy is managed and run. This study is an effort to assess the impact of revenue gap or missing revenue in the economy of Pakistan. While planning or making the budgets, nations set revenue targets to be achieved. But later when the accounts are closed the actual collections of Revenue through taxes or even the non-tax revenue collection would invariably be different as compared to the initial estimates and targets set to be achieved. This revenue-gap distorts the whole system and the economy disturbing all the major macro-economic indicators. This study therefore aims to analyze the reasons and to assess the extent of tax-gap. The tax-gap occurs because of tax avoidance, tax evasion, smuggling, corruption, and through the parallel hidden economy etc. By nature assessing the tax-gap is like calculating the uncertain and the unknown. Besides the extent and degree of the tax gap differs from nation to nation. Attitude towards paying the taxes counts. If not paying the taxes would be generally prevalent and condoned then even the honest taxpayer would be encouraged not to pay taxes, as is the case in most developing countries.

Tax is a core instrument in the hands of the government to fulfill expenditures and it helps in acquiring sustained growth targets. The nature of taxes can help predict a growth pattern. The overall tax burden is considerable in explaining variations in economic growth [1]. In the leading Solow model, in which

technical progress is the major determinant of the long-run per-capita income growth rate, tax policy can affect long-run income levels but not long-run growth rates [2]. The modern endogenous growth models, however, re-opened the theoretical possibility that government tax policy can influence long-run growth rates. Among them are Lucas [3], Jones and Manuelli [4], Rebelo [5], King and Rebelo [6], Yuen [7] and Kim [2]. The models endogenously determined that growth pace depends on the net rate of return from investment, which depends on tax rates. Therefore tax rates can influence the growth rate. So in this era of modern growth, tax is an important source of revenue for any government.

But for citizens, tax is always an unpleasant phenomenon both in developed and developing countries. People adopt different ways to avoid taxes and the revenue is missed from the pool of the government's revenue. An underground economy is generated. Schneider and Frey [8] focus on the fact that an underground economy not only be labeled with illegality. Even if many of the activities are legal, taxes are evaded. Such missed revenue is due to poor performance or loopholes in a tax system.

Missing revenue hinders economic growth and ultimately per capita income will remain low especially in developing countries. Whereas, a higher per capita income shows a higher level of growth, indicating a higher capacity to pay taxes as well as a greater capability to charge and accumulate tax revenue [9]. The tax revenue in Pakistan is far less. There are many reasons for it, like underground economy, tax evasion, smuggling and black market. Yasmin and Rauf [10] find that the underground economy and tax evasion affected GDP negatively in Pakistan. Tax evasion or missing revenue creates serious problems and the government has less revenue to fulfill the budget deficit.

Missing revenue or tax evasion occupies a considerable position in the poor performance of any country. In order to estimate the missing revenue or tax evasion, the difference between what a taxpayer owes as per the statutory tax rates and what the tax administration actually collects in a financial year is determined. This revenue gap is linked with the size of the underground or black economy.

A loss of substantial revenue is an ongoing phenomenon. It remains uncaptured because of complexities and loopholes in the tax code, preferential and various exemptions and/or concessions to the privileged few and a weak tax administration. Through declaring capital income or regular

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income as farm income, smuggling by way of black economy, tariff and tax exemptions, unrecorded transactions, misclassification of commodities and under-invoicing during import or export, tax evasion is undertaken without any moral compunction due to which government loses substantial tax revenue. This lowers the tax-to-GDP ratio far below international norms. This study undertakes assessing the extent and degree of this missing revenue, which if duly collected and netted by the tax machinery, would allow the government to increase revenue and, ultimately, Pakistan's growth.

The tax collection system of Pakistan has some deep-rooted problems and drawbacks. First, a number of extensive exemptions and concessions as well as uncontrolled tax evasion and a narrow tax base. Second, tax rates are inclined steeply, creating a vicious cycle of tax-base attrition and higher tax rates. Third, there is a multiplicity of taxes with an individual organization facing numerous kinds of taxes. Fourth, there is heavy dependence on indirect taxes, which form nearly 60 percent of total revenues. This has increased the regressivity of the tax system and imposed a higher burden of taxation on the poorer segments of society. Fifth, the tax system is complex and tedious which, along with high rates, has generated corruption and encouraged avoidance [11]. Due to institutional inefficiency, revenue collection is always less than the targeted revenue. It is depicted from Table I.

TABLE I
MISSING REVENUE (RUPEES IN MILLIONS)

Years	Total Targeted Revenue	Total Actual Revenue	Difference
1980-1990	939449	827294.2	112154.8
1991-2000	3696587	2796832.8	899754.2
2001-2008	7263400	6650806	612594

Source: Statistical Bulletin (various issues), State Bank of Pakistan

It is clearly shown that there are many handicaps in Pakistan's taxation structure and due to inefficient machinery, the economy has to suffer a lot. Hence, development targets cannot be met. The ability of the tax system to raise revenue over time has deteriorated.

The rest of study is organized as follows. Section II reviews literature, section III discusses data sources and empirical model. Section IV explains methodology for short and long run analysis between revenue gap and economic growth. Section V reports empirical results and section VI presents the main findings and policy implications.

II. LITERATURE REVIEW

There are very few studies which have been conducted to see the impact of revenue gap on economic growth. However, many studies with regard to the subject of missing revenues, taxes and tariffs have been studied in the literature review. The most relevant renowned and important studies were selected for literature review. Pyle [12] finds that one of the implications of the subsistence of the underground economy is that some income remains untaxed and also definite indirect

taxes are evaded. Wang and Yip [13] examines the effect of consumption taxes, taxes on capital and on various factors of out-put for Taiwanese economy. The finding is that consumption taxes and factor income taxes (factor taxation) has opposing and mutually off-setting effect on growth rates of economic aggregates.

Burgess and Stern [14] elucidate that impediments on taxing personal income in developing countries are many including problems of income measurement, administrative capability, low literacy and poor accounting, an economic structure dominated by agriculture and small scale often unregistered enterprises making difficult to tax incomes directly. These problems cause to generate more gap between targeted revenue and collected revenue thereby effect economic growth. Robinson *et. al* [15] analyze and interpreted the effects of changes in tariffs, direct and indirect taxes on revenue, prices, wages and welfare using general equilibrium models. Their study gauges that the impact of transformation from direct tax to indirect tax which is good for a developing country for Pakistan where tax-GDP ration is still 8 percent.

Maingot and Mitchell [16] assert that international tax havens help depositors steal taxes and get away with black money. Tax havens support parallel black economies providing safe havens for the black money. Maingot and Mitchell [16] further propounds that punitive measures against safe havens like Switzerland, Monaco, Guernsey-Gibraltar may be put in place internationally. The banking rules and regulations regarding secrecy and with-holding of information, the working of safe havens like Switzerland etc; this kind of arrangement particularly affected economies of developing countries which were inhabited mostly by people of colour. Beckmann [17] through a simple graphic presentation assesses the extent and impact of tax evasion utilizing the neoclassical pattern of theory of tax evasion and proved that the higher the rate of tax levied the greater will be the tax evasion as the expected return to risk prone tax payers increased.

Kemal [18] estimates the underground economy and tax evasion in Pakistan and shows that for the 29 years each year underground economy and tax evasion increased by 1.83 percent as percentage of GDP. Kemal [18] reaches to the conclusion that size of the underground economy and tax evasion is increased with the increase in investment and greater business activity and decreased in those years when business is low. Sandmo [19] studies the main themes of the theory of tax evasion. Whenever a tax would be levied there would be tax evasion. He reports that the unreported income remains undiscovered the utility and welfare when the angle of the tax payer is maximized. Martinez [20] while assessing the tax system in Pakistan explains that since the bases of the personal and corporate income taxes and the general sales tax are narrow whereas the tax evasion remained high hence the tax to GDP ratio has declined and this downwards trend continued. Therefore tax system direly needs further structural reforms not only on short term but on medium and long term basis which would enhance Pakistan's ability to raise adequate

revenue. Present study is an addition to the above literature review which shed light on the relationship between revenue gap and economic growth.

III. DATA SOURCES AND EMPIRICAL MODEL

The data for the study are time series data covering the time period 1980-2008. They were gathered from the State Bank's Year Book [21], Statistical Year Book of Pakistan Federal Bureau of Statistics [22] and Pakistan Economic Survey [11]. The revenue gap or missing revenue as an explanatory is measured by the difference between targeted revenue and collected revenue. Per capita GDP as an explained variable is taken a proxy for economic growth. Foreign Direct Investment (FDI) to real GDP ratio is taken as an explanatory variable in the model to avoid the problem of functional biasedness.

To see the impact of revenue gap as a ratio of GDP on economic growth, the following model is developed:

$$PGDP_t = \alpha_0 + \alpha_1 \left(\frac{RG}{GDP} \right)_t + \alpha_2 \left(\frac{FDI}{GDP} \right)_t + e_{1t} \quad (1)$$

where

t is time period

α_0 is constant

GDP_t is Gross Domestic Product

$PGDP_t$ is per capita Gross Domestic Product and taken as growth variable

RG_t is revenue gap

FDI_t is foreign direct investment

α_1 and α_2 are coefficients of RG to GDP ratio and FDI to GDP ratio respectively

e_{1t} is usual error term and independent from all independent variables

IV. METHODOLOGY

The study is aimed to find out short and long impact of revenue gap on economic growth for this purpose cointegration is utilized. Before starting the cointegration test, it is essential to check each time series for stationarity. If a time series is non-stationarity, the regression analysis done in a conventional way will produce spurious results. Therefore, in order to examine this property of time series, the unit root test is conducted.

A. Unit Root Test

There are several methods available for the unit root test. This section briefly discusses these methods and models. Dickey-Fuller (DF), Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) test methods are commonly used to examine the stationarity of a time series.

The DF models are as under:

$$(1-L)Y_t = \mu + \alpha_1 Y_{t-1} + e_{2t} \quad (2)$$

$$(1-L)Y_t = \mu + \beta t + \alpha_1 Y_{t-1} + e_{3t} \quad (3)$$

where

Y_t is any time series variable and α_1 is coefficient of Y_{t-1}

L is lag operator

t is time trend and β is coefficient of t

μ is an intercept and

e_{2t} and e_{3t} are white noises

In these models, the null and alternative hypotheses are as under:

$H_0 : \alpha_1 = 0$ (non-stationary series)

$H_1 : \alpha_1 < 0$ (stationary series)

The error term in the DF test might be serially correlated. The possibility of such correlation is eliminated in the following ADF models:

$$(1-L)Y_t = \mu + \alpha_1 Y_{t-1} + \sum_{i=1}^k \gamma_i (1-L)Y_{t-i} + e_{4t} \quad (4)$$

$$(1-L)Y_t = \mu + \beta t + \alpha_1 Y_{t-1} + \sum_{i=1}^k \gamma_i (1-L)Y_{t-i} + e_{5t} \quad (5)$$

where k is lag length, the null and alternative hypotheses in above ADF models are as under:

$H_0 : \alpha_1 = 0$ (non-stationary series)

$H_1 : \alpha_1 < 0$ (stationary series)

Philip-Perron (PP) have taken a nonparametric test as an alternative to ADF test. The ADF test has been reported to be more reliable than the PP test, the problem of size distortion and low power of the test make both these tests less useful [23].

Perron [24] introduces the concept of structural change in the unit root test. He shows that inclusion of structural change in the unit root test might give a different result. He conducted unit root test employing his model on Nelson and Plosser [25] data and found that 11 of the 14 series were stationary. In his model, he allows one time structural change to occur at a time.

Perron [24] develops following models to check unit root in three different cases:

Null Hypotheses:

$$\text{Case(1): } y_t = \alpha_0 + dD(TB)_t + y_{t-1} + e_{6t} \quad (6)$$

$$\text{Case(2): } y_t = \mu_1 + y_{t-1} + (\mu_2 - \mu_1)DU_t + e_{7t} \quad (7)$$

$$\text{Case(3): } y_t = \mu_1 + y_{t-1} + dD(TB)_t + (\mu_2 - \mu_1)DU_t + e_{8t} \quad (8)$$

where $D(TD)_t = 1$ if $t = T_B$, 0 otherwise.

Alternative Hypotheses:

$$\text{Case(1): } y_t = \mu_1 + \beta t + (\mu_2 - \mu_1)DU_t + e_{9t} \quad (9)$$

$$\text{Case(2): } y_t = \mu + \beta_1 t + (\beta_2 - \beta_1)DT_t^* + e_{10t} \quad (10)$$

$$\text{Case(3): } y_t = \mu_1 + \beta_1 t + (\mu_2 - \mu_1)DU_t + (\beta_2 - \beta_1)DT_t + e_{11t} \quad (11)$$

where $DT_t^* = t - T_B$, and $DT_t = t$ if $t > T_B$, 0 otherwise.

The first case permits an exogenous change in the level of the series, whereas the second case permits an exogenous change in variable. The third case allows change in both.

B. Cointegration

As stated earlier, the main objective of the study is to analyze the impact of revenue gap on economic growth. For this purpose, the study of the relationships among relevant time series is essential in portraying the true picture of this impact. This section is dedicated to briefly explaining the methodological framework that investigates the short and long-term relationships among time series variables related to this study. The ARDL modeling approach pioneered by Pesaran and Pesaran [26] and Pesaran *et. al* [27] has numerous advantages. The main advantage of this approach lies in the fact that it can be applied irrespective of whether the regressors are I(0) or I(1) [26]. Another advantage of this approach is that the model takes a sufficient number of lags to capture the data-generating process in a general-to-specific modeling framework [28]. Moreover, a dynamic Error Correction Model (ECM) can be derived from ARDL through a simple linear transformation [29]. The ECM integrates short-run dynamics with the long-run equilibrium without losing long-run information. It is also argued that ARDL approach avoids problems resulting from non-stationary time series data [28]. The ARDL specification of the above equation (1) is as under to find empirical evidence of long-run equilibrium:

$$(1-L)PGDP_t = \alpha_{10} + \sum_{i=1}^p \alpha_{1i}(1-L)PGDP_t + \sum_{i=0}^{q_1} \alpha_{2i}(1-L)\left(\frac{RG}{GDP}\right)_{t-i} + \sum_{i=0}^{q_2} \alpha_{3i}(1-L)\left(\frac{FDI}{GDP}\right)_{t-i} + \lambda_{10}PGDP_{t-1} + \lambda_{11}\left(\frac{RG}{GDP}\right)_{t-1} + \lambda_{12}\left(\frac{FDI}{GDP}\right)_{t-1} + e_{12t} \quad (12)$$

where α_{10} is intercept and e_{12t} is white noise, p , q_1 and q_2 represent the optimum lag length of $(1-L)PGDP_t$, $(1-L)(RG/GDP)_t$ and $(1-L)(FDI/GDP)_t$ respectively. The first step in the ARDL-based cointegration approach is to estimate equations (12) using Ordinary Least Squares (OLS). The second step is to trace the presence of cointegration by restricting all estimated coefficients of lagged level variables equal to zero. The following hypotheses are tested for cointegration in the above equations by the means of F test with an asymptotic non-standard distribution:

For equation (12)

$H_0: \lambda_{10} = \lambda_{11} = \lambda_{12} = 0$ (no cointegration)

$H_a: \lambda_{10} \neq \lambda_{11} \neq \lambda_{12} \neq 0$ (cointegration)

Two asymptotic critical value bounds provide a test for cointegration, when the independent variables are $I(d)$ with $0 \leq d \leq 1$. The lower bound assumes that all the regressors are $I(0)$ and the upper bound assumes that they are $I(1)$. If the computed F-statistic lies above the upper level of the bound, the null hypothesis is rejected, indicating cointegration. If the computed F-statistic lies below the lower level band, the null cannot be rejected, supporting the absence of cointegration. If the statistics fall within the bound, inference would be inconclusive. After confirmation of the existence of a long-run relationship between the variables in the model, the long-run

and short-run models can be derived using information criteria such as the Schwartz, Bayesian or the Akaike Information Criteria.

V. EMPIRICAL RESULTS

A. Level of Integration

The study used annual time series data in empirical analysis covering the period 1980-2008. The annual variables are consolidated per capita GDP (as a proxy for economic growth), revenue gap to GDP ratio and foreign direct investment to GDP ratio. The first step of the time series analysis is to investigate the properties of the series individually. The DF/ADF and PP Unit Root tests are applied to check the stationarity of each variable (discussed in previous section).

The results of unit root tests of time series are given in Table II and Table III at level and first difference respectively. The unit root test indicates that $PGDP_t$, $(GE/GDP)_t$ and $(FDI/GDP)_t$ are non-stationary except $(RG/GDP)_t$ at level. However, $PGDP_t$, $(GE/GDP)_t$ and $(FDI/GDP)_t$ are stationary at 1st difference or I(1). In this scenario ARDL or bounds testing approach is more suitable as discussed in previous chapter, proposed by Pesaran *et al.* [30]. The total number of regressions estimated in empirical model (12) are $(4+1)^3 = 125$. The optimum lag length of ARDL model is (1,0,1).

TABLE II
UNIT ROOT TEST AT LEVEL

Variables	DF/ADF Test	
	Intercept	Time trend and Intercept
$PGDP_t$	0.10491 (5)	0.6747(5)
$\left(\frac{RG}{GDP}\right)_t$	-5.4817***(0)	-5.3533***(0)
$\left(\frac{FDI}{GDP}\right)_t$	-1.0402(0)	-2.9188(1)
Variables	PP Test	
	Intercept	Time trend and Intercept
$PGDP_t$	-0.01471 (1)	-0.0857 (1)
$\left(\frac{RG}{GDP}\right)_t$	-5.8031***(0)	-6.0501***(0)
$\left(\frac{FDI}{GDP}\right)_t$	-1.0838(2)	-2.2102(2)

Note: lag length of DF/ADF test and bandwidth of PP test are in parenthesis

The long run relationship or equilibrium can be examined using standard F statistic. The calculated F Statistics are reported in Table IV alongwith 90% and 95% significance level. The sample size in this study is relative small. Therefore this study uses critical values given by Narayan and Smyth [31] which are suitable for low sample size. If the computed F statistic is higher than upper bounds then the null hypothesis of no cointegration or long run equilibrium can not be accepted. If F statistics is lower than the lower bound then null hypothesis of no cointegration or no long run equilibrium is accepted. If F statistics falls between lower and upper bounds

then it would be difficult to conclude. In our case calculated F-statistics (3.8603) is higher than upper bound (3.585) at 90% level of significance in second case. This implies that long run equilibrium exists between $PGDP_t$, $(RG/GDP)_t$ and $(FDI/GDP)_t$.

TABLE III
UNIT ROOT TEST AT FIRST DIFFERENCE

Variables	DF/ADF Test	
	Intercept	Time trend and Intercept
$\Delta PGDP_t$	-5.0381(0)***	-5.0083(0)***
$\Delta \left(\frac{RG}{GDP}\right)_t$	-9.6957(0)***	-9.5167(0)***
$\Delta \left(\frac{FDI}{GDP}\right)_t$	-4.3963(0)***	-4.3374(0)**
Variables	PP Test	
	Intercept	Time trend and Intercept
$\Delta PGDP_t$	-6.0470(1)***	-6.1206(1)***
$\Delta \left(\frac{RG}{GDP}\right)_t$	-26.1800(26)***	-28.0529(26)***
$\Delta \left(\frac{FDI}{GDP}\right)_t$	-4.1841(3)***	-3.9360(4)**

Notes: lag length of DF/ADF test and bandwidth of PP test is in parenthesis
*** indicates 1% level of significance
** indicates 5% level of significance

The long run relationship or equilibrium can be examined using standard F statistic. The calculated F Statistics are reported in Table IV alongwith 90% and 95% significance level. The sample size in this study is relative small. Therefore this study uses critical values given by Narayan and Smyth [31] which are suitable for low sample size. If the computed F statistic is higher than upper bounds then the null hypothesis of no cointegration or long run equilibrium can not be accepted. If F statistics is lower than the lower bound then null hypothesis of no cointegration or no long run equilibrium is accepted. If F statistics falls between lower and upper bounds then it would be difficult to conclude. In our case calculated F-statistics (3.8603) is higher than upper bound (3.585) at 90% level of significance in 2nd case. This implies that long run equilibrium exists between $PGDP_t$, $(RG/GDP)_t$ and $(FDI/GDP)_t$.

The test results in Table V indicate that the coefficient of control variable $(FDI/GDP)_t$ is negative when $PGDP_t$ is dependent variable but statistically not significant even at 10% level. This implies that there is no significant long run impact of $(FDI/GDP)_t$ on economic growth. The coefficient of revenue gap $(RG/GDP)_t$ is statistically significant at 10% level and there is a negative association between $PGDP_t$ and $(RG/GDP)_t$. This implies that a decrease in average revenue gap to GDP ratio leads to an increase in the economic growth. The underlying rationale is that when government achieves targeted revenue and does not rely on internal and external sources to meet the revenue deficit the average economic growth increases.

TABLE IV
ARDL BOUNDS COINTEGRATION FOR EQUATION (12)

F – Statistics	90% critical value bounds		95% critical value bounds	
	I(0)	I(1)	I(0)	I(1)
$F_{PGDP} = 2.2306$	2.835	3.585	3.435	4.260
$F \left(\frac{RG}{GDP}\right)_t = 3.8603$				
$F \left(\frac{FDI}{GDP}\right)_t = 1.8632$				

TABLE V
ESTIMATED LONG RUN COEFFICIENTS

Dependent variable is $PGDP_t$ ARDL(1,0,1) Model selected based on Schwarz Bayesian Criterion			
Regressor	Coefficient	Standard Error	t-statistic
$\left(\frac{RG}{GDP}\right)_t$	-0.1884	0.1035	-1.8205 (0.084)
$\left(\frac{FDI}{GDP}\right)_t$	-0.8505	-0.5058	-1.6818 (0.108)
Constant	3405.6	2711.3	1.2561 (0.224)
DIAGNOSTIC TESTS			
χ^2 Serial Correlation = 0.5671 (0.451)			
χ^2 Functional Form = 2.6986 (0.100)			
χ^2 Normality = 1.3538 (0.508)			
χ^2 Heteroscedasticity = 0.9819 (0.322)			

TABLE VI
ERROR CORRECTION REPRESENTATION

Dependent variable is $\Delta PGDP_t$ ARDL(1,0,1) Model selected based on Schwarz Bayesian Criterion			
Regressor	Coefficient	Standard Error	t-statistic
$\Delta \left(\frac{RG}{GDP}\right)_t$	19605.50	8761.80	2.2376 [0.036]
$\Delta \left(\frac{FDI}{GDP}\right)_t$	-7422.50	32489.30	-0.2285 [0.821]
Constant	-354.374	314.753	-1.1259 [0.273]
ECM_{t-1}	-0.10406	-0.0236	-4.4179 [0.000]
Adjusted R ² = 0.86379			
F-statistics(3, 21) = 52.0672 [0.000]			
DW-statistic = 1.7906			

Table VI shows the results of Error Correction Model (ECM) with ARDL (1,0,1) model. The coefficient of ECT_{t-1} is statistically significant at 1% level but has correct negative sign. This significance also confirms the short run cointegration relationship between variables. The coefficient of ECM_{t-1} is -0.10406, which indicates a speed of adjustment to the long run equilibrium after a short run shock. About 10.41% adjustment will take place within one year if there is a shock.

VI. CONCLUSION AND RECOMMENDATIONS

This study investigated the impact of revenue gap on economic growth in Pakistan over the period of 1980-2008. The DF/ADF and PP unit root tests utilized to check the time series properties or level of integration of time series variables. The under investigating variables have mix order of integration i.e. I(0) and I(1). For short and long run empirical analysis ECM and ARDL bounds approach to cointegration utilized. The results reveal that revenue gap is significant and negatively related with economic growth. The coefficient of ECT_{t-1} is significant with correct sign and indicates that that after a shock, the long run equilibrium will again converge towards equilibrium about 10.406 percent within a year.

The econometric results suggest that if the gap between targeted revenue and actual collected revenue is high, it effects economic growth negatively and significantly (in case of Pakistan, most of the times collected revenue is less than targeted revenue). This gap can be reduced by doing away with exemptions and special treatments. The real increase in revenue can take place effectively only when the collective benefits of all stakeholders are upheld fairly and equitably. This, in turn, with greater public spending in areas of both development and non-development, will bring about a more equitable distribution of income and allocation of this enlarged pie. It can generate greater macroeconomic stability and balance. More sustained economic development would be possible by the availability of enhanced and, hitherto, untapped sources of public revenue. This will help the economy achieve greater self-reliance and avoid large public debts to minimize budget deficits. Without imposing high tariff and tax rates, government tax revenue collection can be increased by just broadening the tax network, setting the right priorities and by tightening and improving the tax administration in the Pakistan.

REFERENCES

- [1]. K. Marsden, "Links between taxes and economic growth," *World Bank Staff Working Paper Number 605*, 1983, *The World Bank, Washington, D.C.*
- [2]. S. J. Kim, "Growth effect of taxes in an endogenous growth model: to what extent do taxes affect economic growth?," *Journal of Economic Dynamics and Control*, Vol. 23, pp. 125-158, 1997.
- [3]. R. E. Lucas, "Supply-side economics: an analytical review," *Oxford Economic Papers*, Vol. 42, pp. 293-316, 1990.
- [4]. L. E. Jones and R.E. Manuelli, "A convex model of equilibrium growth," *Journal of Political Economy*, Vol. 98, pp. 1008-1038, 1990.
- [5]. S. T. Rebelo, "Long run policy analysis and long run growth," *Journal of Political Economy*, Vol. 99, pp. 500-521, 1991.
- [6]. R. G. King and S. T. Rebelo, "Public policy and economic growth: developing neoclassical implications," *Journal of Political Economy*, Vol. 98, pp. 126-149, 1990.
- [7]. C. Yuen, "Taxation, human capital accumulation, and economic growth," PhD. dissertation, University of Chicago, Chicago, 1991.
- [8]. F. Schneider and B. Frey, "Informal and underground economy," Economics in Ashenfelter, Orley. *International Encyclopedia of Social and Behavioral Science Vol. 12*, Elsevier Science Publishing Company, Amsterdam, 2001.
- [9]. R.J. Chelliah, "Trends in Taxation in Developing Countries," *IMF Staff Papers*, Vol. 18, No. 2, pp. 254-325, July 1971.
- [10]. B. Yasmin and H. Rauf, "Measuring the underground economy and its impact on the economy of Pakistan," *The Lahore Journal of Economics*, Vol. 9(2). Pp. 93-103, 2003.
- [11]. Pakistan Economic Survey (various issues), Ministry of Finance, Islamabad, Pakistan.
- [12]. D. J. Pyle, "Tax Evasion and the Black Economy," *The Macmillan Press Ltd*, 1989.
- [13]. P. Wang and C. K. Yip, "Taxation and Economic Growth: The Case of Taiwan," *American Journal of Economics and Sociology*, Vol. 51(3), pp. 317-331, 1992.
- [14]. R. Burgess. and N. Stern, "Taxation and Development," *Journal of Economic Literature*, Vol. 31 (2), pp. 762-830, 1993.
- [15]. S. Robinson, A. Yúnez-Naude, R. Hinojosa-Ojeda, J.D. Lewis and S. Devarajan, "From Stylized to Applied Models: Building Multisector CGE Models for Policy Analysis," *North American Journal of Economics and Finance*, Vol. 10, pp. 5-38, 1999.
- [16]. A. P. Maingot and D. Mitchell, "Taxing Free Riders," *Foreign Policy*, Vol. 132, pp 6-8, 2002.
- [17]. K. Beckmann, "Tax Progression and Evasion: a Simple Graphical Approach," *Andrássy Working Paper Series No. III*, Universidad Budapest, Hungary, 2003.
- [18]. M. A. Kemal, "Underground Economy and Tax Evasion in Pakistan: A Critical Evaluation," *Research Report No.184*, Pakistan Institute of Development Economics. Islamabad, 2003.
- [19]. A. Sandmo, "The theory of tax evasion: A retrospective view," *Discussion paper 31/04*, Norwegian School of Economics and Business Administration, Norway, 2004.
- [20]. J. V. Martinez, "Pakistan: A Preliminary Assessment of the Federal Tax System," *International Studies Program Working Paper Series*, Andrew Young School of Policy Studies, Georgia State University, USA, 2006.
- [21]. Statistical Bulletin of Pakistan (various issues), State Bank of Pakistan, Pakistan
- [22]. Statistical Year Book of Pakistan (various issues), Federal Bureau of Statistics, Islamabad, Pakistan.
- [23]. G. S. Maddala and In-Moo Kim, "Unit Roots, Cointegration, and Structural Change," *Cambridge, Cambridge University Press*, 2003.
- [24]. P. Perron, "The Great Crash, the Oil Price Shock, and the Unit Root Hypothesis," *Econometrica*, Vol. 57(6), pp. 1361-1401, 1989.
- [25]. C. R. Nelson and C. R. Plosser, "Trends and random walks in macroeconomic time series: Some evidence and implications," *Journal of Monetary Economics*, Vol. 10(2). Pp. 139-162, 1982.
- [26]. M. H. Pesaran, and B. Pesaran, "Working with Microfit 4.0: Interactive Econometric Analysis," *Oxford, Oxford University Press*, 1997.
- [27]. M. H. Pesaran, Y. Shin and R. Smith, "Pooled mean group estimation of dynamic heterogeneous panels," *Journal of the American Statistical Association*, Vol. 94, pp. 621-34, 1998.
- [28]. J. Laurenceson and J. C. H. Chai, "Financial Reform and Economic Development in China," *Cheltenham, UK, Edward Elgar*, 2003.
- [29]. A. Banerjee, J. J. Dolado, J. W. Galbraith and D. F. Hendry, Cointegration, Error Correction, and the Econometric Analysis of Non-stationary Data. *Oxford, Oxford University Press*, 1993.
- [30]. M.H. Pesaran, Y. Shin, and R. J. Smith, "Bounds Testing Approaches to the Analysis of Long-Run Relationship," *Journal of Applied Econometrics*, Vol. 16, pp. 289-326, 2001
- [31]. P. K. Narayan and R. Smyth, "Temporal Causality and the Dynamics of Exports, Human Capital and Real Income in China," *International Journal of Applied Economics*, Vol. 1(1), pp. 24-45, September 2004.