

Does an Economic and Political Affairs Matter in Determining the Tax Revenue of Jammu and Kashmir State (India): An Approach through VECM Model

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Abstract

The state of Jammu & Kashmir is one of the special category states of India, that faces a severe resource crunch on the one hand and an explosive public expenditure trend on the other hand. The inability of the state government to raise adequate resources of its own cast's serious doubt about the tax efforts carried out by the government from time to time. Against this background, this paper tries to analyze the major long and short run determinants of tax revenue in the state of Jammu and Kashmir by applying suitable econometric methods such as VECM and by taking a broader set of variables which comprise Economic, Political and demographic sectors. The time series data of last thirty years from 1984 to 2013 has been used to identify the short and long run relationship of variables and to analyze the long term equilibrium adjustment rate by short-term variables. The result shows that all the economic variables, except for the income from of agriculture, income from industry and the unemployment rate, have positive influence on the tax revenue. Regarding political stability variables, some like political crises and law and order are significant, while others like the election cycle were found to be insignificant.

Keywords: Tax Revenue, Economic, VECM, Political Stability, Law and Order, Co-Integration.

JEL Classification: H2, H7, H3, H71, H26, H23, E62.

1. Introduction

In a modern welfare state, fulfillment of social desire to have a better quality of life is dependent not only on the capacity of the government

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to mobilize adequate resources but also on the degree of momentum of the economic activities that a state in question attains. Any jolts to this by the erratic behavior in the social, economic and political institutions of the society at large proves to be a hindrance not only to the expanded economic activities but also narrows down the tax base of the economy in question. The interplay of these two forces can be taken as a starting point for any systematic attempt to explain the social, economic and political implications of the tax effort of the state to attain a reasonable degree of sustainable economic growth with a scientific and reliable econometric model.

The state of Jammu and Kashmir is one of the special category states, which is typically characterized by a greater dependence on agriculture. Around 70 percent of its population depends on agriculture as a main source of livelihood. The region is also unique with its great potential in tourism. Significant development has been witnessed in different spheres of economic life in recent years. Yet access to opportunities for a 'reasonable minimum' standard of living in the state is comparatively lower to that of other special category states of the country. The fiscal health of the state is by no means encouraging at all, where the states' own tax revenue contributes hardly 19.7 percent of the total revenue receipts of the state. In the state where own tax revenue contributes no more than 13 percent of the state income, the aggregate government expenditure constitutes as high as 48.9 percent.

As a result, the state has developed a dependency syndrome and that is evident from an explosive cycle of public expenditure growth. Coupled with this, there is an increasing demand for grants-in-aids and other Central assistance to help bridge the gap of large budgetary deficits. This reflects an inadequacy on the part of the state government to generate enough resources to meet the changing volatile fiscal situation. There are number of reasons that can be attributed for this poor state of fiscal health of the state government. We believe that the major factors that have been responsible are (i) static tax base due to low level of economic activities which might have been due to level of infrastructural development, (ii) emergence of a parallel economy due to various tax preferences that the government accord from time to time and (iii) political and economic

intolerance to the expanded economic activities, and the social unrest that the state economy experiences from time to time.

Therefore, we believe that the repercussion from all these forces at work might have resulted in various leakages in tax generating capacity and in narrowing down the tax base of various taxes in the state. If we are to assign a cause-effect relationship to this type of vexed problem then it can be argued that the variables associated with economic and political dimensions are mainly responsible for the low level of tax base and tax revenue in the state of Jammu and Kashmir.

2. Background of Study

The economy of the state of Jammu and Kashmir depends mostly on traditional forms of occupation. The state is affected by continued violence and insurgency which might have slowed down the pace of economic development in the state. We would like to restrain ourselves from passing value judgments as regards to any causal effect relationship between them at this juncture. Unaffected and unaltered by modern day industrial developments and changing times, the indigenous traditional occupations of farming, animal husbandry and horticulture forms the backbone of the economy. Over a period of time, the expansion of economic activities in the state of Jammu and Kashmir has remained static in the sense that there has been a marginal increase in all the basic macro-economic parameters of development. It may be pointed out that the mobilization of resources on the part of the state depends on the expanded economic activities that a state in question attains at a particular point of time through the expansion of economic base. Mobilization of resources in the state of Jammu and Kashmir remains devoid on this particular aspect. As a result, in the absence of a reasonable degree of resource mobilization capacity of the state, continued expansion in the public expenditure front in the state has culminated in the form of an explosive cycle of public expenditure growth thereby giving rise to a situation of fiscal doldrums. The problem further became accentuated by the prevailing social upheavals in the state, which has further deteriorated the fiscal health of the state to certain extent. As a result, there has been gradual erosion in the tax base on the one hand and a tremendous increase in expenditure to address to the growing societal needs in its entire front.

The performance of the state on the resource mobilization front provides rather a poor and dismal picture. The average annual rate of growth of total revenue of the state which was 11.3 percent during the year 1993-94 to 2003-04 increased to 13.7 percent during the period 2003-04 to 2013-14. The average annual growth rate of the tax revenue of the state which was at 9.4 percent during the year 1993-94 to 2003-04 increased to 19 percent during the year 2003-04 to 2013-14. The average annual rate of growth of state's own tax revenue increased from 17.4 percent during the years 1994 - 2004 to 19.2 percent between 2004 -2014. Along with the increase in the state's tax revenue, the contribution of state's own tax revenue to total revenue receipts which was 10.08 percent in the year 1993-94 rose to 13.8 percent in 2003-04 and further, it has increased to 19.7 percent in the year 2013-14. The State's share in Central taxes and duties to total revenue of the state which was 22.8 percent in the year 1993-94 did decline to 9.0 percent in the year 2003-04 and further picked up to 15.3 percent in year 2013-14. It is worth mentioning here that the central grants and assistances constitute 54.2 percent of the total revenue of the state in the year 2013-14 has shown a declining trend from the year 2003-04, where it stood at 70.2 percent. The shared taxes and duties along with grants and assistances as a percentage of total revenue of the state has shown a declining trend from the year 1993-94 where it stood at 83.9 per cent decreased to 79.2 per cent in 2003-04 and further decreases to 69.51 percent in year 2013-14. It implies the state's own tax revenue as a source of revenue to the state has increased over a period of time but its rate of growth does not commensurate the rate of growth of state domestic product and the rate of growth of total tax revenue of the state. As a result, the very disturbing trend has resulted in a huge fiscal deficit in recent years where the state government has failed miserably to bridge the increasing gap between its public expenditure growth and the tax revenue. The fiscal deficit of the state which was at 4.1 percent in the year 1990-91 increased to 6.4 percent in the year 2004-05 and further went up to 7.36 percent in the year 2013-14. This huge fiscal deficit surprisingly surpasses the fiscal deficits of the similarly situated larger states that enjoy special category status like Tripura (7.2 percent), Arunachal Pradesh (1.9 percent), Uttarakhand (3.3 percent) and Nagaland (3.5 percent).

It is evident from the above discussion that over the last thirty years, the basic macro-economic indicators of economic development has remained at a pathetically lower level. This provides enough evidence that the economic activities vis- a- vis the tax base of various taxes staggered at a low level of vicious circle. As a result, the state has not been able to generate sufficient revenue from its own resources and has been facing serious financial problems (Navlakha, 2007). The problem became all the more serious due to the prevailing circumstances in the state affecting both revenue and expenditure. The state suffered from political dispute for a long period, since 1989 onwards, resulting in the erosion of the tax base, increase in expenditure due to destruction of infrastructure and various other factors related with disturbed law and order.

Thus, having all these constraints in the economy and in the region, the importance of mobilizing the internal revenue for overall developmental process in the state has become a prominent issue of the state. Therefore, the paper is an attempt to look in to the intricate relationship between a set of complex socioeconomic and political variable for determining the major determinants of tax revenue of the state to ascertain whether these variables have played any role in resource mobilization process of the state or they have been proved detrimental in the way of tax generating capacity of the state.

With this background, the present study intends to make an in depth analysis of (i) the economic determinants of tax revenue of the state of Jammu and Kashmir. To identify (ii) the major political and demographic determinants of tax revenue in the state of Jammu and Kashmir, and (3) to analyze the tendency of the variables to bring the long run equilibrium in tax revenue.

Keeping consistency with the above mentioned objectives, the study intends to test the following hypotheses.

3. Hypotheses

1. Changes in political and economic variables may have a larger impact on the level of Tax revenue.
2. Economic Variables have significant tendency to stabilize deteriorating tax system

4. Review of Literature

There exists a wide array of studies pertaining to the determinants of tax revenue. Keeping in consistency with the arguments made in the preceding paragraphs, an attempt is made in this section to review some of the major studies carried out so far pertaining to the problem at hand. Ajaz and Ahmed (2010) made a detailed study on the effect of institutional and structural variable on tax revenues in 25 developing countries for the period 1990-2005. The study found that the corruption has adverse effect on tax collection, while good governance contributes to better performance in tax collection. They also found that structural variables like per capita income, trade openness, industrial share and inflation also play important role but different variables have different effects on tax revenue but institutional variables have common effect on tax revenue. Thornton (2014) argued that one percent increase in foreign aid causes a 0.52 percentage decrease in the tax-to-GDP ratio. His study also found that per capita GDP, openness and the share of industry value added in GDP are generally associated with higher tax revenue ratios, while as corruption and revenue from natural resource rents are associated with lower tax revenue ratios. Wawire (2011) showed that Institution variables like monetary activities, Volume of trade, volume of import and demographic variables like Population are also significant determine the VAT revenue in Kenya. Aisha and Khatoon (2010) showed that in general terms government expenditure causes change in tax revenues which means that government expenditures and tax revenues exhibit a stable long run relationship that is unilateral causality from expenditures to tax revenue

Stotsky and WoldeMariam (1997) with panel data from 30 countries using multiple regression analysis find that the share of agriculture and mining in GDP has a negative impact on tax revenue. However, export share in GDP and per capita GDP are positively significantly associated with tax revenue performance. Piancastelli (2001); Moore (2013) with cross section regression analysis, found that per capita income and the ratio of trade to GDP are positively strong determinants of tax revenue, whereas, share of agriculture in GDP is negatively associated with tax revenue. Karagoz (2013); Castro and Camarillo (2014) uses ADF unit root test followed by

Multiplicative regression model to find out the determinants of tax revenues. Their study observe that tax revenue is significantly affected by agricultural, industrial sector share in GDP, foreign debt stock, monetization rate of the economy and urbanization rate, while the agriculture share in GDP found negatively associated with tax revenue. The results also suggest that openness to foreign trade has no significant impact on tax revenues.

With advanced econometric technique Muibi and Sinbo (2013) carried out an empirical analysis of determinants of tax revenue in Nigeria by using Regression model with ADF unit root test and Granger's Causality test. The authors observe that the tax revenue tends is significantly responsive to changes in income level, exchange rate and inflation rate. They conclude that macroeconomic instability and level of economic activities are the main drivers of tax buoyancy and tax effort in Nigeria. Davoodi and Grigorian (2007) found that the tax collection rate (especially direct taxes) in Armenia did not increase with the same pace as GDP. They also found that institutional quality, urbanization and shadow economic activity are the main factors behind low tax-to-GDP ratio in Armenia. Auriol and wartlers (2005); Teera (2000) estimated the level and composition of tax revenues in developing countries. Their study suggest that the tax to GDP ratio is Positively correlated with the following variables, viz., the size of international trade sector, percent of urban population, adult literacy rate, and per capita income. On the other hand, an increase in aid inflow, percent of old population, population density, the degree of monetization, and the rate of inflation are found to be associated with a lower tax to GDP ratio. The study of Eslava et al. (2014) and Addison et al. (2002) finds that external conflicts do not increase the fiscal capacity of the states, if the duration of the conflict is short or if the conflict does not involve many countries.

Aamir et al. (2011) made an attempt to study the determinants of tax revenue. His study compares the determinants of tax revenue in India and Pakistan on these two variables. His results show that Pakistan is generating more tax revenue through indirect taxes whereas India is generating more tax revenue from direct taxes. The studies of Dhanasekaran (2000); Sharma and Singh (2015) using co-integration, PCA and regression model find that the government

expenditure, inflation, population growth rate, non-developmental expenditure and exports have a significant impact on the government tax revenue in India. Similarly, Bhat and Nirmalala (1993); Dholakia (2009) in their respective studies tried to identify the main determinants of Tax revenue in different states of India by employing multiple regression models. Their study shows that Per capita deficit, Urban population, Per capita Expenditure and Per capita income of the states has significant impact on Tax revenue while the other variables such as Primary sector income, Literacy rate, Density of Population, Schedule cast Population and Political variables are found to be insignificant. Mukhopadhyay and Das (2003) tried to measure the Horizontal imbalance between revenue and expenditure in India. Their study shows that Variations in tax base, tax effort, infrastructural facilities - both physical and social - and political uncertainty are important determinants of horizontal imbalances between revenue and expenditure in India.

Rajaraman and Vasishtha (2000) made an attempt to study the impact of state-local grants on tax effort of rural local governments (panchayats) for Kerala state using data for 1993-94. Their study found that the population of local area is positively associated with own tax revenue. Further the study found that the Bagchi (2003) made an attempt to identify the determinants of property tax in local government in major cities of India. His study finds that property tax is determined by Carpet area of the residential building, Specified rate of tax, Location factor, Age factor, Type of building factor and Occupancy factor. Binswanger-Mkhize et al. (2012) carried out a study on the impact of restricted and unrestricted fiscal grants on tax efforts of Rural Local Governments in India by using ARIS/REDS panel data of 241 villages representing 17 major states of India. Their study shows that although there exists a positive impact of wages on taxation, its impact is found to be very small. Further, the study concludes that the productivity impact of grants on taxes is found to be either zero or negligible. This means that incentives effects associated with the specifics of the inter-governmental fiscal system in the states is the main determinant of village taxation. Dholakia (2000) in his study found that high economic subsidies reduce the non-tax revenue in Gujarat. Ovung (2002) in his study conclude that the

increase in Income and a change in prices have significant impact on the growth of Tax revenue in Nagaland.

5. Methodology

The core exercise in this section is to attempt a model of determinants of government expenditure on a vector of relevant explanatory variables as suggested in the existing literature by taking into consideration the unique economic and political institutions that are in place in the state of Jammu and Kashmir. In the study we intend to use time series data set for the period, 1984-85 to 2013-14. This is a period during which the state economy has passed through phases of both upswing and downswing owing to wide fluctuation in its agricultural sector on the one hand and social tensions and conflict on the other hand. The data has been collected from RBI, Election commission of India, home ministry and south Asian Terrorism portal. The data has been converted into natural log equations for time series so that the coefficients represent the Elasticity (Gujarati, 2008).

At first it is important to identify the variables from economic and political dimensions in context of Jammu and Kashmir. The variables used in this study reflect the actual economic and political structure of the state. The variables used in this study are;

Dependent variable: total revenue collected by levy of Taxes (Tax revenue- *tr*)

Explanatory Variables

Economic variables: Per capita income (*PCI*), Indirect taxes (*indtex*), total outstanding (*Outstand*), Share of Agriculture to NSDP(*Sagri*), Share of Industries to NSDP(*Sind*), share of Services to NSDP(*sserv*), value of exports(*Expo*), rate of unemployment(*Unemp*).

Political variables: Political Crises (*crises*), Law and order (*Law*), Election Cycle (*elecyc*)

The econometric framework adopted in this study is based on developments in co-integration model suggested by Johansen (1988, 1995). By applying VECM techniques to the time-series data, based on the results of unit root and multivariate co-integration test, we are able to approximate a dynamic structure in which initially all the variables in both the models are treated as endogenous. Most time-

series analysis demonstrate non-stationary characteristic in their mean or trending pattern. Therefore, in order to determine the suitable method of time-series econometric analysis, a common approach is to identify the form of the trend in the data and whether individual data series contain unit root characteristic. If the data is trending, then some form of de-trending is needed. The most common de-trending practices are differencing and time-trend regressions. Thus, the first step in co integration modeling is often taken by testing for unit roots to determine whether trending data should be differenced or regressed on deterministic functions of time.

On the bases of results from these two tests, estimated models has been identified. Therefore, on the bases of results two regression models have been used separately for each determinant in order to avoid multi-collinearity issue. Error Correction model has been used for economic determinants like Dritsaki (2005), Kadrzycki (2014). While as, multiple regression model has been used for political determinants of tax revenue like Teera (2002), Stotsky & Woldemerein (1997). Thus the study divides all the explanatory variables into two equations according to determinants.

6. Estimation Procedure

The important step before estimating and necessary transformation of models is to verify the time series properties of the data. This is a significant issue since the use of non-stationary data in the absence of co-integration test can generate spurious regression results. Non-stationary data leads to spurious regression due to non-constant mean and variance (Dimitrova, 2005). To this end, the Augmented Dickey-Fuller (ADF (1979) and Philips Pearson (PP()) test has been adopted to examine the stationarity, or otherwise, of the time series data. The lowest value of Akaike Information Criterion (AIC) has been used in this study to decide the optimal lag length in the ADF and PP regression model for each determinant and for models of the study. These lags were used in ADF and PP regression to make sure that the error term is white noise. The regression form ADF test is in following form:

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \sum_{j=1}^p \gamma_j \Delta y_{t-j} + \varepsilon_t \quad (5)$$

Where, Δ is the first-difference operator, y_t is the respective variable of expenditure over time, p is lag, α_0 is constant, α_1 and γ_j are parameters and ε_t denotes stochastic error term.

If $\alpha_1 = 0$, then the series is said to have a unit root and is non-stationary. Hence, if the hypothesis, $\alpha_1 = 0$, is not accepted according to equation it can be concluded that the time series does not have a unit root and is integrated of order I(0), or in other words it has stationarity properties.

Similarly the regression form Phillips-Perron (PP) test is in following form:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \alpha_2 (t - T/2) + \mu_t \quad (6)$$

Where $\alpha_0, \alpha_1, \alpha_2$ are the expected least-squares regression coefficients. The hypotheses of stationarity to be tested are $H_0: \alpha_0 = 1$ and $H_0: \alpha_1 = 1, H_0: \alpha_2 = 0$.

Co-integration Test

After analyzing whether the series is stationary in levels or first-difference or integrated in same order, we tried to apply Johansen's co-integration method (Johansen, 1988) to verify whether there exist co-integrating vectors among all other variables or not except the political variables because of the dummy nature of the variables. The Johansen's co-integration test employs two test statistics to identify the number of co-integrating vectors. They are (i) the Trace test and (ii) the Max Eigen value test. The trace statistic test is calculated by using the following expression:

$$LR_{tr}(r/n) = -T * \sum_{i=r+1}^n \log(1 - \check{Y}_i)$$

Where

\check{Y} is trace statistic value, n is the number of variables in the system and $r = 0, 1, 2, \dots, n-1$ co-integrating equations.

The test statistic for Max Eigen value is computed as:

$$LR_{max}(r/n + 1) = -T * \log(1 - \check{Y})$$

Where

\check{Y} is the Max Eigen value and T is the sample size.

In case Max Eigen value statistic and the Trace statistic yield different results, then trace test statistic will be preferred as suggested by Alexander (2001).

Estimated Models

The study has been divided in to two models. VECM model has been conducted to know the economic determinants of tax revenue on the bases of unit root and co integration results. While as, multiple regression method has been used for political determinants. A vector error correction model (VECM) is a modeling technique which adds error correction features to a multi-factor model to understand the long run as well as short run relationship among the variables after knowing that the variables are co integrated (Jang 2008, kadrzycki 2014, Massiefield 2000). The study follows the methods adopted by Mubi & sinbo (2013), kadrzycki (2014) and Massiefield (2000) to develop our model for the study. We have divided the economic variables further into two VECM equations in order to avoid the problem of multi-collarity (Karagoz 2013). The subsequent Vector Error Correction models for economic determinants are shown below:

$$\begin{aligned}
 Dlntr_t = & \alpha_1 + \sum_{i=0}^n \beta_1 Dlntr_{t-i} + \sum_{i=0}^n \beta_2 Dindtax_{t-i} + \sum_{i=0}^n \beta_3 DPci_{t-i} \\
 & + \sum_{i=0}^n \beta_4 DSagr_{t-i} + \sum_{i=0}^n \beta_5 DSserv_{t-i} + \sum_{i=0}^n \beta_6 Dexpo_{t-i} \\
 & + \prod ECT_{t-1} + \epsilon_{1t} \quad (I)
 \end{aligned}$$

$$\begin{aligned}
 Dlntr_t = & \alpha_2 + \sum_{i=0}^n \gamma_1 Dlntr_{t-i} + \sum_{i=0}^n \gamma_2 Doutsatnd_{t-i} + \sum_{i=0}^n \gamma_3 DSind_{t-i} \\
 & + \sum_{i=0}^n \gamma_4 Dunmp_{t-i} + \prod ECT_{t-1} + \epsilon_{2t} \quad (II)
 \end{aligned}$$

Where D is the difference level of the variable and ln is the natural log. α_1 and α_2 are the long run coefficients of the two equations. ECT is the Error coefficient term of the long term relationship of the variables and $\prod t$ are the Error coefficients of the two equations which

capture the adjustment of independent variables in the long run. Also $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6 are the short run coefficients of the respective variables of VECM equation I and $\gamma_1, \gamma_2, \gamma_3$, and γ_4 are the short run coefficients of the respective variables in Equation II. The hypothesis of both the equations is tested on probability value of t-statistics at 5% and 10 % level of significance.

Political Determinants Model

The study uses OLS multivariate regression model, Roa (1979), Amir et al. (2011), Purohit (2006) to test the political determinants of tax revenue. The dummy variables have been chosen as explanatory political variables like Political crisis (Cukierman, 1994; Drazen, 2006) were 0 is for the years, when there was political parties ruling, and 1 when there was Presidents rule in the state. Law and order, Addison et al. (2002) were 0 when there were less than 500 civilian deaths and 1 when there were more than 500 civilian deaths in a year in the state (Jong-A-Pin 2006). Finally election cycles were 0 for normal year and 1 for election year. The regression equation tested for Political determinants of tax revenue is shown below:

$$D\ln tr_t = \alpha_1 + \delta_1 Pcrisis_t + \delta_2 law_t + \delta_3 elec_t + \varepsilon_t \quad (III)$$

Where D is difference level of the variable, ln is the natural log and α_1 is the intercept of the model. δ_1, δ_2 , and δ_3 are the coefficients of Political crisis, law and order and election cycle. ε_t is the Error term of the model. The coefficients and the hypothesis of the model will be tested on probability value of t-statistic at 5 and 10% level of significance.

Diagnostic Tests

In order to check the strength of our models estimated, different diagnostic tests have been carried out. Breusch-Godfrey Serial Correlation or LM Test was done for serial correlation of the models; ARCH Test (autoregressive conditional heteroscedasticity) has been carried for Heteroscedasticity. Similarly, the test for parameter stability of the model has been performed by the CUSUM statistics and the Normality test has been done through Jarque-Bera test. All the diagnostic tests are estimated through null hypothesis which are tested

through the test statistic value of each test and the probability value at 5% level of significance.

8. Results and Discussion

Unit Root Test

Before going for ADF test the Schwarz-Bayesian Criterion (SBC) and Akaike Information Criterion were used to determine the optimal number of lags included in the test. Table 1.1 present the results of the unit root tests both at levels and 1st differences.

Table 1.1: Augmented Dickey-Fuller Unit Root Test Statistic

S.no	Variables	Definition of variables	At level			1st difference Stationary I(1)		
			t-statistic	5%	P value	t-statistic	5%	P value*
1	taxrev	Total tax revenue	-3.48	-3.57	0.559	-5.86	-3.58	0.0003
2	Indtax	Share of indirect taxes	-1.42	-2.96	0.555	-5.92	-3.58	0.0002
3	outstand	Total outstand	-2.03	-3.57	0.556	-5.41	-3.58	0.0008
4	Pci	Per capita income	-2.97	-3.57	0.156	-6.01	-2.97	0.0000
5	sagr	Share of Agri. in nsdp	-1.96	-3.57	0.640	-5.94	-3.58	0.0002
6	sind	Share of ind.in nsdp	-2.37	-3.57	0.385	-5.90	-2.97	0.0000
7	sserv	Share of serv in nsdp	-2.37	-3.57	0.385	-5.90	-2.97	0.0000
8	Sxpo	Share of exp in nsdp	-2.71	-3.58	0.237	-2.26	-1.96	0.0252
9	unemp	Rate of unemployment	-2.55	-3.57	0.302	-4.68	-3.58	0.0043

*MacKinnon (1996) p .value @ 5%

All variables under investigation were found stationary at level and after first difference all the variables are non-stationary. Thus we conclude that tax revenue, share of indirect taxes to total tax revenue, total outstanding, per capita income, share of agriculture to NSDP, Share of Industries to NSDP, Share of Services sector to NSDP, value of exports and unemployment rate are having an integrated order on I(1). Thus we will use VECM model to test the long and short run relationship of the variables under study.

Johansen Co Integration Test

Since after running the unit root test and observe that the variables are at I (1) order and having stationary at 1st difference, we will go for the Johansen co-integration test to analyze the number of co integrated Vectors. The Johansen-Juselius (1990) test has been used to identify

Table 1.2a: Result of Johansen Co-Integration Test

Equation I: Series: TAXREV IND TAX OUTSTAND PCI SAGR SIND SSERV SSXPO UNEMP

Unrestricted Cointegration Rank Test				
Hypothesized		Trace	5 %	1 %
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None **	0.966529	348.6129	192.89	204.95
At most 1 **	0.929047	253.4951	156.00	168.36
At most 2 **	0.873866	179.4146	124.24	133.57
At most 3 **	0.783239	121.4431	94.15	103.18
At most 4 **	0.642976	78.63231	68.52	76.07
At most 5 *	0.598566	49.79366	47.21	54.46
At most 6	0.408923	24.23770	29.68	35.65
At most 7	0.283942	9.515032	15.41	20.04
At most 8	0.005811	0.163193	3.76	6.65

Table 1.2b				
Hypothesized		Max-Eigen	5 %	1 %
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None **	0.966529	95.11784	57.12	62.80
At most 1 **	0.929047	74.08046	51.42	57.69
At most 2 **	0.873866	57.97151	45.28	51.57
At most 3 *	0.783239	42.81082	39.37	45.10
At most 4	0.642976	28.83865	33.46	38.77
At most 5	0.598566	25.55596	27.07	32.24
At most 6	0.408923	14.72267	20.97	25.52
At most 7	0.283942	9.351839	14.07	18.63
At most 8	0.005811	0.163193	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level , Trace test indicates 6 and 5 Co integrated equations(s) at 5 and 1% level, Max-Eigen value test indicates 4 and 3 co integrated Equation(s) at 5 and 1% level.

the number of co-integrated vectors and to sum up whether the variables have long run association. The Johansen co integration test is determined by two statistics, i.e. Trace statistic and Max-Eigen statistics which are subjected to the number of hypothesis. The results of Johansen co integration test are presented in table 1.2a and 1.2 b.

Table 1.2a and 1.2b presents the results of Johansen co-integration test against the null hypothesis of no co-integrated equation among variables. The trace statistics suggests that there are at most 5 co-integrating equation among the variables and the variables have long run relationship. Similarly max Eigen statics conclude that there are at most 3 co- integrated equations among the variables. Thus the Max-Egan statistic also shows that all the variables have long run relationship. Therefore, the Johansen co-integration test indicates that the variables have long run association with each other. Thus in order to know estimate the coefficient of short run as well as long run relationship among the variables, as the variables are co integrated, so we will proceed for VECM test.

9. Result of the Models

As we discuss in the methodology section that in order to remove the problem of multi-collinearity we will split the economic variables into two VECM equations, to know the significant variable which affects the tax revenue in the state of Jammu and Kashmir. Table 1.3 presents the results of two VECM equations which show the economic determinants tax revenue.

Table 1.3 Result of Vector Error Correction Model for Economic Variables

Penal A: long run estimates							
Long Run estimates: Equation 1				Long run estimates: Equation II			
Regressor	Coff.	S.E	T.Stat.	Regressor	Coff.	S.E	T. Stat.
Dtaxrev(1)	1						
Dindtax(1)	1.08	1.9	4.11**				
DPCI(1)	0.2	0.012	16.3**				
Dsagri(1)	-0.023	0.0056	-4.19**				
Dsserv(1)	0.15	0.0041	38.54**				
Dsexpo(1)	0.012	0.0009	12.40**				

Table 1.3 Result of Vector Error Correction Model for Economic Variables

Penal B: Short run estimates						
Dep. Var: TAXREV	Equation I			Equation II		
Ind. Variables	Coefficient	t-Statistic	Prob.*	Coefficient	t-Statistic	Prob.*
C	7.828762	4.116672	0.0012			
D(TAXREV(-1))	-5.76605	-2.92763	0.0118			
D(TAXREV(-2))	-3.0227	-2.1981	0.0467			
D(INDTAX(-1))	5.351724	2.850832	0.0136			
D(INDTAX(-2))	2.600142	2.145964	0.0513			
D(PCI(-1))	0.845078	1.231081	0.2401			
D(PCI(-2))	1.326701	2.3956	0.0324			
D(SAGR(-1))	-1.38307	-2.63279	0.0207			
D(SAGR(-2))	-1.17103	-2.5587	0.0238			
D(SSERV(-1))	2.171677	2.428106	0.0304			
D(SSERV(-2))	1.888181	1.79524	0.0959**			
D(SSXPO(-1))	0.414272	3.227266	0.0066			
D(SSXPO(-2))	0.050663	0.410379	0.6882			
ECM C(14)	-0.64825	-0.71563	0.0869**			
C				0.56523	5.300134	0.0001
D(TAXREV(-1))				-0.54116	-2.65116	0.0168
D(TAXREV(-2))				-0.51544	-2.5042	0.0228
D(OUTSTAND(-1))				-0.43429	-4.08591	0.0008
D(OUTSTAND(-2))				-0.18996	-1.77491	0.0938
D(SIND(-1))				0.57798	2.768471	0.0131
D(SIND(-2))				0.128829	1.350666	0.1945
D(UMEMP(-1))				-4.96173	-0.06477	0.9491
D(UMEMP(-2))				-12.66826	-0.17141	0.8659
ECM C(10)				-0.27113	-5.48588	0
R-squared	0.835512	Adj. R-sq	0.67102	R-sq	0.945068	Log lik.ho -169.33
Log likelihood	45.3556	D.W	1.88765	Adj. R-sq	0.915987	D.W 2.2382

* at 5% level of significance ** 10% level of significance

The long run estimates of economic variables presented in VECM equation I and II are shown in penal A of table 1.3. Equation I of

Penal A reveals that indirect taxes, income from services sector, per capita income, income from agriculture sector and value of exports are the key determinants of tax revenue in long run. In long run, indirect taxes have positive and significant impact on tax revenue as expected. 1% increase in indirect taxes will lead to 1.08% increase in tax revenue. Indirect taxes like sales tax, excise duty, stamp and registration duty etc. are the taxes easily collected by the government over the years thus with increase indirect taxes the tax revenue increases. The result is in tune with the findings of (Wawire, 2011) and is statistically significant at 1% level of significance.

Per capita income as the proxy of economic growth also shows positive and significant impact on tax revenue in long run. It implies that with increase in per capita income of the people by 1%, tax revenue increases by 0.20% and is significant at 1% level of significance. These results are in line with (Stotsky & Woldemmerin, 1997).

Agricultural income to NSDP is negatively related to tax revenue collection. 1% percent growth in agriculture income to NSDP will reduce tax revenue by 0.023%. It is statistically significant at 1 percent level and indicates that more share of agriculture sector reduces the tax revenue. Agriculture has almost 29 percent contribution in GDP of Jammu and Kashmir but its contribution in tax revenue is almost 1 percent because of low tax on the income from agriculture sector. Tanzi (1992) and Bird *et al.* (2008) support this negative relationship of income from agriculture sector to tax revenue.

The sign of income from services sector is positive and is statistically significant at 1% level of significance. It implies that in long run 1% increase in income from services sector increase the tax revenue by 0.15%. The results are in line with (Karagoz, 2013). Similarly the value of exports also shows positive and significant relationship with tax revenue. It implies that 1% increase in value of exports in the state will increase the tax revenue by 0.012%. It reveals that with the increase of export value of goods in the state the tax revenue will also increase. These results are also supported by (Rao, 1979; Gupta, 2007).

Similarly, the long run estimates of the economic variables in equation II, provided by penal A shows that outstanding, per capita

income has positive and significant while as income from industry and rate of unemployment has negative and significant impact on tax revenue collection in long run. The results show that total outstanding has positive and significant impact on Tax revenue in the long run and the variable is significant at 5% level of significance. The above equation shows that 1% increase in outstanding of the state will increase the tax revenue by 1.19%, which are valid results in line with (Thompson, 1999; Purohit, 2006). It is a desirable result, because the increasing level of outstanding forces the government to impose new taxes and increase the tax base in order to repay the debt which increase the tax system efficiency as the state has to make more efforts to reduce the outstanding.

Surprisingly, income from industry sector shows negative and significant impact on tax revenue in long run. It reveals that 1% increase in income in industry sector reduces the tax revenue by -0.91% and the coefficient is significant at 1% level of significance. These results are against the findings of by (Stotsky & Woldemerein, 1997; Karagoz, 2013). It might be due to the industrial status of the state. The state has very poor and sick industrial sector. Due to the social conflict in 90's the wide industrial base of the state has hit by vast destruction. Therefore huge tax holidays, tax exemptions, heavy subsidies and many more incentives has been given to industrial sector over the years to increase the industrial base of the state. It is interesting to know over last 2 decades there was no commercial tax, wealth tax and excises duty on the industrial sector of the state. Thus over the years with increase in income of industry sector to NSDP the tax revenue decrease because huge income of industry sector is not taxed.

Rate of unemployment shows negative and significant impact on tax revenue in long run. The penal A, shows that 1% increase in rate of unemployment reduce tax revenue by -0.49% and the coefficient is significant at 5% level of significance. These results are in line with (Buttner, 1999) but against to (Aghazadah, 2014). With increase in unemployment rate the sources of income reduce to the people which affect their level of income and thus taxation as well. Also with increasing rate of unemployment government has to give many subsidies and on different indirect taxes to benefit the unemployment classes.

Next step is to estimates of short run dynamic coefficients of economic variables in equation I and II. The short run dynamic results for economic variables are provided in table 1.3 in penal B for VECM model I and II. The table reveals that Indirect taxes at lag 1 and 2 (According AIC % SIC criteria) are significant determinants in the short run. The short run error coefficients show that both at $\text{indtax}(-1)$ previous year and $\text{indtax}(-2)$ previous of previous year has positive and significant impact on the tax revenue of current year at 5% level of significance. It shows that 1% increase in indirect taxes at $\text{indtax}(-1)$ will increase the tax revenue at 5.35% and 2.60% as 1% increase at lag 2 in ($\text{indtax}(-2)$).

The per capita income shows that it is positively related to tax revenue at lag 1 but insignificant to produce change in tax revenue but significant in lag 2. In other words we can say that previous year's PCI of the state does not have any impact on current year's tax revenue but two years back PCI has significant impact on current year's tax revenue. It shows that 1% increase in PCI in previous year can increase current year's tax revenue by 0.84%, while as 1% increase in PCI in previous of previous year increases the current year's tax revenue by 1.32%, and it is also statistically significant.

The share of agriculture income shows negative but has a significant impact on tax revenue at both 1 and 2 lag at 5% level of significance (0.0207 and 0.0238). The results of error coefficient model shows that, at lag 1 of SAGR, 1% increase in SAGR in previous year will reduce the tax revenue of current year at -1.38%, and at lag 2, 1% increase in SARG(-2) will reduce tax revenue at -1.17%.

The coefficient of share of services sector to NSDP shows that it has positive and significant impact on tax revenue at both the time lags at 5% and 10% level of significance. It implies that, 1% increase in services sector income at 1 lag will increase the tax revenue by 2.17% and by 1% increase in services sector income at lag 2 will increase tax revenue by 1.18% as the variable is significant at 10 % level of significance. The share of exports in NSDP shows that it has a positive and significant impact on tax revenue at lag 1, but positive and insignificant impact on tax revenue at lags 2 at 5 % level of significance.

Penal B of table 1.3 also present the short run estimates of economic variables in equation II. The results reveal that that the total outstanding over lag 1 has negative and significant relationship with tax revenue at 5% level of significance in short run and also over lag 2. It is also negative and significant at 10% level of significance. It shows that 1% increase in total outstanding in previous year (Outstand (-1)) will reduce the tax revenue of current year at -0.43% at 5% (0.008) level of significance. Also 1% increase in total outstanding in previous of previous year (Outstand (-2)) will reduce the tax revenue over -0.18% at 10% (0.0978) level of significance. Hence it shows the severity of total outstanding on the collection tax revenue over the period as the total outstanding of the state is mounting at higher rate.

The share of industrial sector to NSDP shows positive and significant association to tax revenue in first lag, but in lag 2 it shows insignificance towards tax revenue. It implies that previous year's share of industrial sector income growth has significant impact on current year's tax revenue while as two years back share of industrial sector has no impact on current year's tax revenue. The table 1.3 shows that 1% increase in previous year's share of industrial sector income will increase the tax revenue by 0.57%, which is significant at 5% level of significance, while as lag 2 shows insignificance with tax revenue. Finally the rate of unemployment shows insignificant relationship with tax revenue in the short run. As the p value is greater than 5 and 10 % level of significance so we could not find any association between rate of unemployment and tax revenue in short run in the state of Jammu and Kashmir.

The results obtained for VECM model through both the equations (I and II) are satisfactory in terms of Jammu And Kashmir State is concerned. As indirect taxes are major sources of tax revenue, so the effect of Indirect taxes will be more on tax revenue also the less tax base and exemption of various direct taxes over long period of time in the state, like commercial taxes, wealth taxes, property taxes etc. have increase the importance of indirect taxes in the state. As the per capita income of the state is at average level so the effect of PCI is also moderate to Tax revenue. As the state has gone through long period of stagnation so it has very less major economic activities which increase the PCI of people like industry sector, services sector etc. and the

share of agricultural income to NSDP is reducing in the state as the people are engaged in other activities in industry, services sector and other informal sectors. Also, the agriculture sector of the state is not taxed much, so increases in share will reduce tax revenue. As far as services sector of the state is concerned, it is the only growing sector of the economy but due to lot of constraints like infrastructure of the state and law and order problems, the sector also shows less coefficient to tax revenue, but as the SSERV variable has positive impact on tax revenue it is due to the tourism sector and telecom sector. The state is known for its handicraft and handloom works which generates goods of export quality thus as the value of exports to NSDP has increased over the years the tax revenue has also increased.

The state of Jammu and Kashmir is leading in the having huge liabilities, thus level of outstanding forces the government to impose new taxes and increase the tax base in order to repay the debt which increase the tax system efficiency as the state has to make more efforts to reduce the outstanding. As we know that state has remained under taxes for almost two decades thus imposing new taxes or increasing rate of taxes would not affect the economy. Thus with increase in outstanding liabilities the tax revenue has increased. The state has very poor and sick industrial sector. Due to the social conflict in 90's the wide industrial base of the state has hit by vast destruction. Therefore huge tax holidays, tax exemptions, heavy subsidies and many more incentives has been given to industrial sector over the years to increase the industrial base of the state. It is interesting to know over last 2 decades there was no income tax, commercial tax, and wealth tax and excises duty on the industrial sector of the state. Thus over the years with increase in income of industry sector to NSDP the tax revenue decrease because huge income of industry sector is not taxed.

The error coefficient of the Error Correction Term (ECM) which is denoted by $C(14)$ for equation I is negative(-0.64825) and statistically significant at 10% level of significance. It shows that any fluctuation caused in previous years, or in the short run will bring equilibrium in long run at 64% or in other words it means that it will take at least two years to restore any disequilibrium in tax revenue. So the variables of our first model shows evidence of fast pace of response to bring

equilibrium in tax revenue when there are shocks in short run. The negative coefficient of error correction model determines the speed of adjustment to long-run equilibrium.

The error correction term ECM denoted by $C(10)$ for equation II is (-0.27113) and is statically significant at 5% level of significance. The negative coefficient is an indication that any shock that takes place in the short-run would be corrected in the long-run. It indicates the speed of error correction and the approach toward long term equilibrium. The negative coefficient indicates that 27% of an imbalance in a period of total tax revenues is modified in next period. So, the emergence of a momentum regarding the economic variables in table 1.4, maintains its effect on total tax revenues after one year. The adjusted R-Squares of both the models suggest that 64% variation in tax revenue in equation I and 91% variation in tax revenue in equation II is explained by the respective variables.

The different diagnostic tests were carried out in order to check whether our models have given the right results. Breusch-Godfrey (LM Test) was carried out to know whether the models has the problem of serial correlation or not and ARCH test was done to check the heterokidasticity of the models. Also normality test of Jerque Bera and CUSUM test are carried out to check the normal distribution assumption and strength of our models. The diagnostic tests for both the models indicate that models have no serial correlation, no misspecification of functional form and no heteroscedasticity. Stability of the coefficients has been shown with the help of cumulative sum of recursive residuals (CUSUM) test. As CUSUM tests verify that estimated lines are inside the critical lines at 5 percent level of significance, so it shows the stability of the model. In other words, models have no structural break and it can be applied for policy options. Durbin Watson results show that model does not suffer for autocorrelation.

Political Determinants of Tax Revenue

Another regression model was estimated to know the political determinants of tax revenue in the state of Jammu and Kashmir. The regression equation analyzed is shown below:

$$DTAXREV = C(1)*CRISIS + C(2)*LAW + C(3)*ELECY + C(4)$$

The regression result of political variables is shown in table 1.8 below.

Table 1.8: Summary of Regression Results for Political Variables

<i>DTAXREV = C(1)*CRISIS + C(2)*LAW + C(3)*ELECY + C(4)</i>			
Variable	Coefficient	t-Statistic	Prob.
CRISIS	-0.42093	-1.47935	0.0698**
LAW	-1.12577	-5.66481	0.0002*
ELECY	-0.29969	-1.05323	0.3170
C	8.809681	62.69166	0.0000
R-squared	0.787042	Adjusted R-squared	0.723155
Log likelihood	-3.45501	Durbin-Watson stat	1.393177
Breusch-Godfrey Serial Correlation LM Test			
F-statistic	0.407772	Probability*	0.678209
Obs*R-squared	1.295169	Probability*	0.523308
ARCH Test			
F-statistic	0.000136	Probability*	0.990911
Obs*R-squared	0.00016	Probability*	0.989893
Normality test			
Jarque-Bera*	1.15598	Prob*	0.561413

Sources: Calculated by us, * at 5% level of significance, **10% level of significance

The result of political determinants equation, where tax revenue was a dependent variable and political crisis, law and order and election cycle are independent variables, show that all the political variables have negative association with tax revenue which means that political stability in the state will have significant impact on tax revenue. But among the three political variables, Political crises and Law and order variables are statistically significant while as election cycle was found insignificant to produce change in tax revenue. If we look at the table political crisis has negative coefficient (-0.42093), and significant impact on tax revenue. It shows that 1% increase in political crises will lead to reduce tax revenue by -0.42%, the probability value is less than 10% level of significance. It implies that

with change of political ruling in the state from elected government to governors or presidents rule, which is often seen in the state, the tax revenue decline by -0.420%. It is due to the issue that democratically elected party or ruling party has efficient management and machinery to collect taxes from different sources by implementing policies and to run the state efficiently, while as in governors ruling the bureaucrats only manage day to day affairs of the government and hardly engage in efficient policy making and efficient mechanism to improve tax system. The results are in line with (Jong-A-Pin, 2006; Drazen, 2006).

Law and order (Number of civilian deaths in year) has also negative coefficient (-1.12577), but its probability value is less than 5% (0.0002) level of significance which means that it is a significant variable to produce change in dependent variable. And these results are in tune with the study of (Addison *et al.*, 2002; Dristsaki, 2005). It implies that 1% increase in the law and order situation, or in other words, 1% increase in civilian deaths can reduce the tax revenue by -1.25%, which is an expected result. It is due to the factor that with increasing number of civilian deaths, the people protest and strikes become common, which results economic activities slow down, markets remain closed for longer period of time, business units cannot function properly due to the strikes, and most importantly during high law and order crises public authorities are not able to move to collect taxes from different sources. Thus with increasing law and order problem has direct effect on functioning of economic activities and which in turn reduce tax revenue.

Finally the election cycle was also found negative related to tax revenue as in tune with the study of (Mukhopadhyay & Das, 2003) but as its probability value (0.3170) is greater than 5% level of significance, thus it is considered as insignificant variable to produce change in tax revenue. Thus by analysis of the political variables we found that political crises and law and order situation in the state has significant impact on tax revenue.

The stability and accuracy of our model can be checked by R^2 of the model. The R^2 of the model is (0.787042) implies that, over the model 78% of variation in tax revenue is explained by the political variables mentioned above. Durban Watson statistic is also close to 2 which imply that there is no problem of multi- collinearity.

Similarly other diagnostic tests were carried out to prove the stability, normality and serial correlation and heteroscedasticity of our model. Table 1.8 also shows that the model doesn't have problem of serial correlation. ARCH Test also shows that the model doesn't have the problem of heteroscedasticity. Normality tests were carried out through Jarque-Bera test. It shows that the series in the model is normally distributed as probability value is greater than 5% level of significance.

10. Conclusion

The study tries to examine the economic and political determinants of tax revenue in the state of Jammu and Kashmir, over the period 1984-85 to 2013-14. The study finds very appealing results which can help to improve the tax structure in the state. The study finds that economic and political variables are most effective instruments which produce significant change in tax revenue in the short run as well as in the long run. The study shows that from the economic point of view the variables like Indirect taxes, income from services sector to NSDP, total outstanding, Value of exports and PCI are highly positive and significant variables to produce change in tax revenue in long run as well as in short run. While as surprisingly, income from industry sector to NSDP, rate of unemployment and share of agriculture has been found negative and significant determinant of tax revenue in long run as well in short run as well. Similarly the political determinants of tax revenue shows that political crisis and law and order has negative and significant impact on Tax revenue growth, while election cycle has positive but insignificant impact on tax revenue which we were expecting.

The political stability in terms of law and order and political ruling in the state has carried a big role in generating revenue through taxes in the state. It has been seen that law and order problem and change in political ruling has reduce the efficiency of tax revenue over the years. Similarly the economic indicators have the potential to generate sufficient amount of growth to tax revenue of the state.

Thus, by analyzing the tax structure of the state through different economic, political and demographic variables, we accept the null hypothesis that change in economic and political determinants have a

larger impact on the level of tax revenue and demographic determinants are positively correlated with the growth of Tax revenue. Thus our study will recommend to the policymaker of the state that more and more factors of economic variables like tourism, industry, telecommunication, trade, marketing, and business should be brought under taxation as the state has large number of economic activities which have not been taxed for taxation yet and has been given lot of tax exemptions and tax holidays to these sectors. These sectors are performing very well from last few years, so these sectors are still either not taxed or under-taxed which can help to improve the tax system if proper and appropriate tax will be imposed on them. There should be a reform in the existing agricultural and industry policies to reap the dividends from growing agriculture to one hand and for sustainable industrial growth. Also state should take more care of law and order situation in the state for free and smooth progress of economic activities which will help to improve the existing tax structure of the state.

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