



## Does Causation Hold In Between Sdp And Ntr In West Bengal Vis-À-Vis Other State In India: A Study Of Time Series And Panel Data

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### ABSTRACT

In spite of this marked increase in the absolute level of collection of non-tax revenues, it has remained static at less than 1 per cent of GSDP. The state government during the 10-years period from 1995-96 to 2005-06 has surely enhanced its own revenue mobilisation by more than 200 per cent but as its revenue expenditure have gone up simultaneously, its capacity to finance revenue expenditure out of own revenue receipts has declined by more than 16 per cent during the same period. The LLC test shows stationary of the series at second difference for trend and intercept. Kao test of panel cointegration shows that the SDP and NTR are cointegrable. The results of the study suggest that state domestic product of the states are causing the non tax revenue of the states and the non tax revenue of the states are also causing state domestic product of the states for West Bengal and Indian federal system.

### KEYWORDS

SDP, NTR, Panel Data

### Introduction

Fiscal health of Indian states is deteriorating in the recent past with serious implications on their developmental efforts. Inadequate revenue sources, uncontrolled growth of current expenditures and failure of central transfers to grow as fast as the states 'own revenues' have been the major causes of fiscal imbalance at state level. In fact, states' expenditures have been growing which has resulted as shrinking of capital expenditure. Other factors responsible for poor fiscal health of states are up-trend of non-developmental consumption expenditure, high cost of Government employees and implementation of the Sixth Central Pay Commission. From the revenue receipts side, poor tax collections, poorly targeted cost recovery policy and lack of appropriate tax reforms have adversely affected the income buoyancy of the states. The state budget in Indian federation is divided into revenue and capital account (Report on Currency and Finance 1980). Accordingly, states receive revenue from revenue account and capital account. Non-tax revenue of the states comprises interest receipts, receipts from general services like lotteries, fees received from providing various social and economic services etc. But the rates and fees charged for such services are insignificantly low.

In spite of this marked increase in the absolute level of collection of non-tax revenues, it has remained static at less than 1 per cent of GSDP. The state government during the 10-years period from 1995-96 to 2005-06 has surely enhanced its own revenue mobilisation by more than 200 per cent but as its revenue expenditure have gone up simultaneously, its capacity to finance revenue expenditure out of own revenue receipts has declined by more than 16 per cent during the same period. Non-tax revenues grew at a compound annual rate of 7.6 per cent in the 10 years ending 2009-10 (Economic survey 2012-13). Further, the states do not have the same ability to finance their growing fiscal imbalance as availed by the Central Government. The states do not have independent power to borrow from the open market, nor from Reserve Bank of India because of the regulation of the overdrafts. Given these constraints on borrowing, the burden of adjusting the imbalance in state finance has tended to fall mainly on capital and maintenance of expenditures with adverse implications in terms of infrastructural constraints, declining productivity of state public sector enterprises and ultimately deceleration in long term growth of economy of the states. These issues have been brought out by several studies like Aiyar and Kurup (1992), Rao and Sen (1993), Srivastava *et al.* (1998), George (2002), Srivastava (2002), Gaur (2002).

It has been found that most of the studies in the field of public finance like Anderson *et al.* (1986), Artis and Buti (2000), Baghestani and McNow (1994), Chang *et al.* (2002), Garcia and Henin (1999), Hassan and Lincoln (1997), Hondroyannis and Papapetrou (1996), Joulfaian and Mookerjee (1991), Kollias and Makrydakis (1995), Manage and Marlow (1986), Miller and Russek (1990), Owoye (1995), Gounder *et al.* (2007), Kollias and Paleologous (2007) and Pandey and Dixit (2009) have concentrated on revenue and expenditure of the government using cointegration and error correction mechanism.

West Bengal is on the eastern neck of India, stretching from the Himalayas in the north to the Bay of Bengal to the south. The fertile Gangtiki delta lies in the State. Fallow land in the state is small relative to that in many States of the country. West Bengal has a population of about, 91,347,736 as per the 2011 census out of which 62213676 (68.11 percent) are rural and 29134060 (31.89 percent) are urban. With an area of 88752 square km, there is an average population density of 1028 persons per square km. The population growth rate of West Bengal was recorded 13.93 percent during 2001 to 2011. During 2001 to 2011 the decadal growth rate in rural and urban areas was recorded as 7.73 percent and 29.90 percent respectively. Total literacy rate in West Bengal was recorded 77.08 percent as per census 2011. The slow growth of the state economy can be attributed to various factors. Political willingness is one of the major factors which affected pace of economic development though there was political stability in the state. Low productivity in agriculture and allied sectors has adversely affected employment and income generation. Poor industrial infrastructure along with low level of investment is the major reason for the slow growth of industrial sector in the state.

The relationship between Non Tax Revenue (NTR) and State Domestic Production (SDP) has been an important issue of discussion among scholars and economists throughout the world. The existence of nexus in between NTR and SDP can be examined in several ways like growth rates relating to SDP and NTR, proportion of NTR to SDP, several policies relating to accelerate SDP and NTR, etc. So far as inter-state non-tax revenue and state domestic product in India is concerned, limited studies have been done. This is the one of the important study which tries to explore the stationarity and cointegration between Non Tax Revenue and State Domestic Product of West Bengal and other nineteen states of Indian federal system in time series and panel data structure for the period 1980-81 to 2010-11.

### Objective of the Study:

To know the stationarity and cointegration in between State Domestic Production and Non Tax Revenue of the West Bengal state for the period 1980-81 to 2010-11 in terms of total and growth rate.

To compare the stationarity and cointegration in between State Domestic Production and Non Tax Revenue of the major nineteen states of the Indian federal system and compare with the West Bengal state for the period 1980-81 to 2010-11 in terms of total and growth rate.

To know the stationarity and causation between SDP and NTR for the panel data structure in the Indian federal system of twenty major states including West Bengal.

### Data and Econometric Methodology:

Panel data allow us to control individual heterogeneity among variables that change over time but not across entities (such as government policies, regulations, agreements, etc.) (Baltagi)

### Fixed-Effects Model:

Fixed effect models are used only for analysing the impact of variables that vary over time.

These models explore the relationship between Tax Revenue, non tax revenue and State Domestic Product within states. Each states has its own individual characteristics that may or may not influence the predictor variables. The equation for the fixed effects model becomes:

$$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it}$$

In the present study data has been taken from Handbook of Statistics on Indian Economy and State Finance for West Bengal and other nineteen major states; Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Nagaland, Orissa, Punjab, Rajasthan, Tamil Nadu, Tripura and Uttar Pradesh (Handbook of Statistics on Indian Economy 2011-12). For a proper comparison of stationarity over time, the revised series of SDP should be extended backwards. For this purpose, first we computed the price correction factor<sup>1</sup>. In the present study, stationarity has been calculated for State Domestic Product (SDP) and Non Tax Revenue (NTR) in time series data for individual state (interstate comparison in terms of level and growth rate) and panel data. The stationarity in time series for SDP and NTR, various test of unit root have been applied and in panel data Levin Lin and Chu (LLC) test and Im, Pesaran, and Shin (IPS) test have been applied. Cointegration between SDP and NTR in long run for West Bengal and other major nineteen Indian states the Engle Granger test and Johansen cointegration test have been used. A Panel Residual-based test has been performed for panel cointegration (Kao1999) between state domestic production and non tax revenue for the twenty major Indian states including West Bengal.

### Results

Stationarity test suggests that State Domestic Product and Non Tax Revenue for West Bengal at level and first difference is not stationary. Augmented dickey fuller at second difference and second lag suggest that SDP and NTR are stationary (ie  $\tau_{SDP} = -4.522$  and  $\tau_{NTR} = -4.546$  at one percent critical value  $\tau_{tabulated} = -4.371$ ). Stationarity test suggest that both the series i.e. SDP and NTR are integrated of order 2, i.e. I(2). Growth rate of two series i.e. SDP and NTR for the West Bengal for the study period suggest stationary at first difference. Hence growth rate of SDP and NTR for west Bengal are integrated of order one i.e. I(1). Stationarity of two series suggest that cointegration in between SDP & NTR and NTR & SDP can be performed. The residuals for both the regression et, used for the unit root test. If the series is stationary then the SDP and NTR are causing each other the results show that both the residuals are stationary at level hence the Engle Granger methodology suggests that SDP and NTR for the West Ben-

gal are causing each other in the long run. Eigen values for the Johansen cointegration also suggest the cointegration between SDP and NTR for the West Bengal.

Two types of test can be distinguished based on the panel unit root test (Kappler 2006). First type of test considers a homogeneous alternative (Levin Lin and Chu 2002, Breitung 2000 and Hadri 2000) and the second type of test considers heterogeneous alternative (Im, Pesaran and Shin 2003, Maddala and Wu 1999 and Choi 2001). In the present study, Levin Lin and Chu (LLC 2002) and Im, Pesaran and Shin (IPS 2003) tests of stationarity have been used. LLC test suggests that the SDP and NTR of panel series suggest presence of unit root at level and first difference in trend and intercept model but stationary at second difference. IPS test shows that Panel SDP and NTR for twenty major states in India are stationary at first difference for intercept and trend. Kao (1999) test specifies cross-section specific intercepts and homogeneous coefficients on the first-stage regressors in the panel cointegration. In the bivariate case for panel SDP & panel NTR the model is of the form where and . The estimated residuals are containing a unit root. For this residual we run an ADF test. The Kao test used the null hypothesis of no cointegration for the panel. The Kao test for panel data of SDP and NTR rejects the null hypothesis of no cointegration.

### Conclusion

The present study focuses on the nexus of the non tax revenue and state domestic product of West Bengal and other major nineteen Indian states for the period 1980 to 2010. The study is based on the time series and panel data. The unit root test suggests stationarity of time series at second difference for the period under study i.e. the series are cointegrable of I(2). Cointegration test also suggest two way causations in between SDP and NTR for the state West Bengal for the study period. Similar result found for some major states of Indian federal system. For twenty states in Indian federal system, panel unit root test applied on SDP and NTR in the present study. The LLC test shows stationarity of the series at second difference for trend and intercept. Kao test of panel cointegration shows that the SDP and NTR are cointegrable. The results of the study suggest that state domestic product of the states are causing the non tax revenue of the states and the non tax revenue of the states are also causing state domestic product of the states for West Bengal and Indian federal system.

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