INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, ECONOMICS & MANAGEMENT

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INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

SCOPE FOR FURTHER RESEARCH

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APPENDIX/ANNEXURE

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CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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AN EVALUATIVE STUDY OF THE CAUSES OF DIFFERENTIAL FDI INFLOWS IN ROADS & BRIDGES LEADING TO INEQUALITY IN REGIONAL ECONOMIC GROWTH IN INDIA

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ABSTRACT

This paper empirically examines, using ANOVA model with the help of average data for the period 2004-2010, that significant disparity in regional economic growth in India exists. Moreover, disparities in economic growth exist among regions but not across political affiliations. Interestingly, we found in our study using interaction dummy that political affiliation has significant say in the east in making growth different there compared to NWC region as well as south. However, in our study, using ANCOVA model, we have found FDI in roads & bridges, statistically to be a cause of this disparity in regional economic growth. Differential inflows of FDI in roads & bridges across regions could be because of per capita income (measured in terms of per capita NSDP), average road density and population density (size of the region), of which average road density has greater impact on differential inflow, though insignificant, during the study period 2004-2010. As a policy prescription, the Govt. should complement general policy prescription along with strategic discretionary state policy measures to reduce regional economic growth inequality.

KEYWORDS

FDI in roads & bridges in India, ANOVA & ANCOVA model, Inequality in regional economic growth.

1. INTRODUCTION

The issues of regional economic growth and inequality have drawn considerable attention among researchers, planners and policy makers. Taking care of regional imbalances has been one of the main targets of the Indian planning. It has also been felt that the disparities among regions have been increasing steadily and the benefits of the rapid growth have not been able to reach all parts of the country in an equitable manner. Growth to be 'more inclusive' nationwide, it is practically necessary that the benefits of economic growth be shared equally by all the regions of the country. It has been argued that because of reforms, income disparities among states are widening (see, for example, Bhattacharya & Sakthivel, 2004; Das & Barua, 1996; Ghosh, 2008; Kar & Sakthivel, 2007). However, Ahluwalia (2000) and Ahluwalia (1996) argue that implementation of these reforms programmes has led to substantial growth in India after 1992, and both the rich and poor states have experienced the benefits of the economic reforms.

Economists have found various factors that have close association with the regional development levels. Infrastructure is conjectured to be more important among them. There are large inter-state disparities in all types of infrastructures, such as physical, social and financial infrastructures in all the years between 1971-72 and 1997-98. While most of the states, initially better endowed in each type of infrastructure, strived to maintain their relative positions. The poor-endowed states were poor performers in infrastructure development during the period 1971-72 till 1997-98. While the good performing states in one or multiple categories of infrastructures were largely successful in achieving higher income, the poor performing states in infrastructure development were lagging in income growth. This reveals the fact that regional disparities in physical, social and financial infrastructures have close association with regional distribution of income.

The growth content of FDI in India may also be maligned by the concentration of FDI in relatively advanced locations (Aggarwal 2005). To the extent that greater openness to FDI in the post-reform era has lead to further agglomeration, FDI may have fuelled regional divergence, rather than promoting convergence. The Schumpeterian growth model presented by Aghion et al. (2006) provides an explanation why more FDI may promote growth in relatively advanced regions, while leaving growth almost unaffected in poorer regions. FDI flows to India are heavily concentrated in a few states. Measured by the amount of approved FDI in 2001-2005, almost 26 percent of overall FDI was located in Maharashtra, followed by Delhi (13.6 percent), Karnataka (11.3 percent), Gujarat (8.3 percent) and Tamil Nadu (6.3 percent), which vouches regional concentration of FDI inflows in India.

2. LITERATURE REVIEW

India has experienced wide regional imbalance in achieving development goals. Whether such imbalances have widened over the years or not, have been studied by various researchers. Their conclusions however, diverge. Williamson (1965 and 1968) did the pioneering work in this regard and concluded that regional inequalities in India increased during the 1950s. This conclusion was refuted first by Dhar and Sastry (1969) and then by Mahajan (1982). Others claiming for a narrow down of regional disparity are Gupta (1973), Lahiri (1969) and Rao (1972). More or less converging results have been reported by Majumdar (1970), Nair (1982), Ganguli and Gupta (1976) and Mathur (1983 and 1987). As against this thought, there have been studies that either show a rise in regional inequality or do not at all find any evidence to reveal significant narrowing down of the gap. Venkataramiah (1969), Rao (1973), Nair (1973), Chaudhry (1974), Sampath (1977) and Mohapatra (1978) belong to this thought who argue that regional imbalances in India have increased over the years. Such disagreement, regarding inequality in regional income growth, has mainly been due to the short span of these studies and the sensitivity of the conclusion towards choice of initial and terminal years. Also, majority of these studies have used aggregate regional income (or consumption) levels, making development a uni-dimensional factor, captured by income or consumption level alone. Mathur (2000) has covered, in one long sweep, the issues of National and Regional

Growth experiences in India from 1950-51 to 1996-97 and in some cases up to 2000, using not only overall state per capita income, but also sectoral per capita income and concluded that regional disparities had decreased till mid-sixties but have increased thereafter.

Published studies on infrastructure in the Indian context have been sparse and researchers who have studied availability of infrastructural facilities in India and its regional variation include Shah (1970), Shri Prakash (1977), Gulati (1977) and Arunkumar & Upendranath (1993). The relationship between development and infrastructure has been studied by Tewari (1983 and 1984), Amin (1990), Dadibhavi (1991), Gayithri (1997) and Ghosh & De (1998). Most of them have concluded that the relation between them is positive and significant and a major part of the regional disparity in development can be attributed to regional imbalance in physical infrastructure. Alagh (1987) studied various dimensions of infrastructural planning in India using empirical analysis of different models and projects.

3. MOTIVATION

Multitude of literature suggest that while the role of FDI in infrastructure in widening regional income inequality has received increasing interest from academic scholars of late, yet these studies have focused on the general level of infrastructure i.e., physical, social and financial infrastructure. This evinced our special interest to go in for study relating to the factors responsible for differential inflow of FDI in roads & bridges in India leading to regional economic growth disparity, in particular, to fill in the gap and thus supplementing the growing literature on FDI in infrastructure, in general.

4. OBJECTIVE

To see whether different regions and/or different political affiliations enjoy differential economic growth performances because of FDI in roads & bridges or not and what are the factors that impact differential FDI inflows in roads & bridges in different regions.

5. METHODOLOGY

Per Capita NSDP at factor cost (at current price) has been obtained from the CSO website as on 01.03.2012 and average per capita NSDP is computed by the researchers from the data. Average road density data is computed by the researchers from the Report **'Basic Road Statistics of India'**, Government of India, Ministry of Road Transport & Highways, Transport Research Wing, July 2010 (Page 34-35) and August 2012 (Page 5-6). Population Density data is based on Census 2011, obtained from *wikipedia.org/wiki/list-of-states-and-union-territories-of-India-by-population* as on 10/05/2012. Information regarding ruling political party or coalition is obtained from *http://en.wikipedia.org/wiki/List_of_Chief_Ministers_in_India*. D2 & D3 are the region dummies (where reference region is North-West-Central) and D4 is political affiliation (either ruling party or in coalition) dummy. All data relate the period 2004-2010.

REGION-WISE DATA ON AVERAGE ROAD DENSITY, AVERAGE FDI, AVERAGE PER CAPITA NSDP AND POPULATION DENSITY

Region	Dummy 2 (South)	Dummy 3 (East)	Dummy 4 (Political Affiliation)	Average Road Density (Per 100 sq.km of Area)	Average Per Capita NSDP (Rs.)	Average FDI in roads & bridges (Rs.)	Population Density (/km2)
New Delhi	0	0	1	728.72	192066.5	1873.363	12698
Mumbai	0	0	1	143.68	61393.66	4372.267	3232
Kolkata	0	1	1	105.66	295872.66	195.878	1576
Hyderabad	1	0	1	80.21	43912	3078.133	308
Chennai	1	0	1	349.745	132013.17	167.186	3153
Bangalore	1	0	0	129.4	45143.33	72.77	319
Bhopal	0	0	0	54.71	54585.33	10.9	425
Kochi	1	0	1	514.98	51189.83	0.733	2872

Note: The states covered under the regions are New Delhi (Delhi, part of UP and Haryana), Mumbai (Maharashtra, Dadra & Nagar Haveli, Daman & Diu), Kolkata (West Bengal, Sikkim, Andaman & Nicobar Island), Hyderabad (Andhra Pradesh), Chennai (Tamil Nadu, Pondicherry), Bangalore (Karnataka), Bhopal (Madhya Pradesh, Chattisgarh) and Kochi (Kerala, Lakshadweep).

Sources:

(I) Average Per Capita NSDP is computed by the Researchers from the data (Per Capita NSDP at factor cost at current price for 2004-2010) obtained from the CSO website as on 01.03.2012

(II) Average Road Density data is computed by the researchers from the Report 'Basic Road Statistics of India', Government of India, Ministry of Road Transport & Highways, Transport Research Wing, July 2010 (Page 34-35) and August 2012 (Page 5-6).

(III) Population Density data is based on Census 2011 obtained from Wikipedia.org/wiki/list-of-states-and-union-territories-of-India-by-population (10/05/2012)

(IV) Information regarding ruling political party or coalition is obtained from http://en.wikipedia.org/wiki/List_of_Chief_Ministers_in_India

(V) D2 & D3 are region dummies (where reference region is North-West-Central) and D4 is political affiliation (either ruling party or in coalition) dummy

Here, first, we want to test whether there is any significant difference between the mean per capita NSDP between the regions, i.e., between reference region (north-west-central region) and south or east. Since, here the regions are expressed in terms of binary variables, the model being one of dummy variable regression. A regression model, which contains quantitative regressand and all qualitative regressors, is known as **Analysis of Variance (ANOVA)**. The Eviews 6 output is as shown below;

$NSDP = ß_0 + ∂_0 * D_2S + ∂_1 * D_3E + u$

$\widehat{NSDP} = 102681.8 - 34617.25 * D_2S + 193190.8 * D_3E$

SE = (34147.25) (45172.56) (68294.49)

t = (3.007031)** (-0.766334) (2.828791)**

(F-Statistic = 5.966348) (R^2 = 0.704713)

Here we see that the intercept coefficient is 102681.8. This means that per capita NSDP of the north-west-central (NWC) region, where NWC region is the reference region, is Rs. 102681.8. This value is significant also. Per capita NSDP of south differs from NWC region and is lower by Rs. 34617.25, though this difference is not statistically significant. Per capita NSDP of east differs from NWC region and is higher by Rs. 193190.8, which is statistically significant also. Here, we see that though per capita NSDP of south does not statistically differ from NWC region but that of east statistically differs from NWC region. Though per capita NSDP differs from that of south by Rs. (193190.8 - 34617.25) = Rs. 158573.5, but its statistical significance cannot be tested. To test statistical significance of this difference, we have to use either east or south as reference region. On using east as the reference region, we get the Eviews 6 output as follows;

$NSDP = ß_0 + ∂_0 * D_2S + ∂_1 * D_3NWC + u$

$\widehat{NSDP} = 295872.7 - 227808.1 * D_2S - 193190.8 * D_3NWC$

SE = (59144.76) (66125.86) (68294.49)

t = (5.002517)*** (-3.445068)*** (-2.828791)***

(F-Statistic = 5.966348) (R^2 = 0.704713)

Here when we use east as the reference region, we see that all the three coefficients are statistically significant. The intercept is the per capita NSDP of east and it significantly differs from that of south as well as NWC region. Thus we see that so far as economic growth performances of the regions are concerned, differential exists between east and south as well as east and NWC region but not between south and NWC region.

This regional differential in per capita NSDP might be because of multitude of factors, out of which FDI in roads & bridges is one, for when there is FDI in roads & bridges that will lead to construction of roads and thus in turn ensure better connectivity and mobility of factors of production. The smooth flow of factors of production will ensure higher productivity and supply of goods & services on time to warrant higher economic growth. If we want to see whether FDI in roads & bridges has any role in regional differential of per capita NSDP or not, we have to go *ceteris paribus* i.e., holding FDI in roads & bridges constant we have to see the regional differences in per capita NSDP to observe change in the new estimates from the earlier ones. If the difference between east & south and east & NWC region lowers in the new estimation then FDI in roads & bridges could be pinned down to be one of the causes of regional differential in per capita NSDP.

A regression model which is an admixture of quantitative as well as qualitative variables, i.e., the regressand is quantitative and the regressors are qualitative as well as quantitative (control variable or covariate) in nature, the model is known as **Analysis of Covariance (ANCOVA)**. Here, FDI in roads and bridges is the covariate and holding this covariate constant we want to see the regional differences in per capita NSDP. On using east as the reference region, we get the Eviews 6 output as follows;

$NSDP = ß_0 + ∂_0 * D_2S + ∂_1*D_3NWC + ß_1*FDI + u$

$\widehat{NSDP} = 296819.3 – 224745.0* D_2S – 184058.8*D_3NWC – 4.832683*FDI$

SE = (65477.59) (73836.25) (81474.71) (16.18278)

t = (4.533143)*** (-3.043830)*** (-2.259092)** (-0.298631)*

(F-Statistic = 3.282723) (R^2 = 0.711153)

Here, in this new estimation we see that though the differences between per capita NSDP of east & south and per capita NSDP of east & NWC are still significant, but the differences have been lowered, meaning thereby that ceteris paribus regional per capita NSDP differences are smaller, which leads to statistical strengthening of economic reasoning of the role of FDI in roads & bridges in growth performances (measured in terms of per capita NSDP) differential. Moreover, the coefficient for FDI is negative (– 4.832683) and marginally significant, that is to say, if FDI in roads & bridges increases by Re.1, per capita NSDP decreases by Rs. 4.832683, establishing a negative relationship between FDI in roads & bridges and per capita NSDP. Since, the gestation period of roads & bridges construction is longer and since FDI in roads & bridges in India started being reported from the year 2004, therefore the period 2004-2010, seven years is not sufficient enough to translate the benefits of FDI in roads & bridges into economic growth, which accounts for the negative relationship.

Sometimes, per capita NSDP might vary across political leaderships also. Generally, it has been observed that inflow of FDI in all the sectors, in general, and FDI in infrastructure (including roads & bridges), in particular, fructify after approval in all those regions where the party which is ruling at the centre or the coalition, being in power, governs the region. So, presumably, the reign of ruling party or the coalition government has always had a favourable impact on regional economic growth. To see whether, political affiliation has had any impact on the regional per capita NSDP differential or not, we use political affiliation dummy, as given in the dataset. On using east as the reference region, we get the Eviews 6 output as follows;

$NSDP = ß_0 + ∂_0 * D_4PA + u$

$\widehat{NSDP} = 49864.33 + 79543.64 * D_4PA$

SE = (64382.67) (74342.70)

t = (0.774499) (1.069959)

(F-Statistic = 1.144812) (R^2 = 0.160230)

From the above output we see that per capita NSDP differential because of political affiliation though exists i.e., per capita NSDP of politically affiliated regions is more than that of not-affiliated regions by Rs. 79543.64 but, this difference is not statistically different from zero. Hence, we can nullify per capita NSDP, in this study, varying across political affiliations, as data doesn't support it.

Sometimes, regions and political affiliations interact within them and become jointly the significant cause of per capita NSDP differential, which singly, perhaps, they cannot be. To see how far it is true, we have to use interaction dummy between region as well as political affiliation to see whether political affiliation depends on region and vice´- versá or not. When we consider NWC region as the reference region where the intercept implies political non-affiliation in NWC region, the Eviews 6 output is as follows;

$NSDP = ß_0 + ∂_0 D_2S* D_4PA + ∂_1 D_3E* D_4PA + u$

$\widehat{NSDP} = 88297.20 - 12592.20 D_2S* D_4PA + 207575.5 D_3E* D_4PA$

SE = (31042.72) (47418.54) (69413.64)

t = (2.844377)*** (-0.265554) (2.990413)***

(F-Statistic = 5.183323) (R^2 = 0.674620)

Here we see that, in the south, political affiliation statistically does not trigger much difference in economic growth performance as compared to non-affiliation in the NWC region, but political affiliation in the east statistically makes difference from non-affiliation in NWC region. That is to say, regional difference in economic growth depends on political affiliation in the east, but not in south. When we consider east as the reference region where the intercept implies political non-affiliation in east, we see that political affiliation does not have any bearing on region, as shown in the Eviews 6 output as follows;

$NSDP = ß_0 + ∂_0 D_2S* D_4PA + ∂_1 D_3NWC* D_4PA + u$

$\widehat{NSDP} = 131867.1 - 56162.11 D_2S* D_4PA - 5137.027 NWC* D_4PA$

SE = (59839.45) (84625.77) (94614.48)

t = (2.203682) * (-0.663653) (-0.054294)

(F-Statistic = 0.256971) (R^2 = 0.093208)

From the above discussion, it becomes clear that political affiliation has a little role and that too in east in making differential in economic growth performance, but hardly has any role in the south as well as the NWC region. Thus we see that growth performance though varies between regions but the same barely varies between political affiliations and if political affiliation at all plays any role, it is in the east.

Since we have pinned down FDI in roads & bridges as one of the important causes of differential in economic growth performance across regions and since inflows of FDI in roads & bridges in different regions are different, we now try to find significant factors causing differential FDI in roads & bridges. Inflow of FDI in roads & bridges depends on a multitude of factors, of which conjecturally some critical factors are, existing level of development (measured in terms of per capita NSDP), road density and population density. The relationship between FDI in roads & bridges and existing level of development is such that if development is there, more investment and more production will be there. Higher investment and higher production will require smooth logistics (physical distribution of factors of production as well as finished products), which in turn, requires optimum roads, highways and ports etc. That is to say, if existing level of development is high in any region, inflow of FDI in roads & bridges will be higher, resulting in a positive relationship. But, in case of India, growth rate of population over the years has notably been higher than the growth rate of NSDP, making per capita NSDP fall, thus making the relationship between FDI in roads & bridges and per capita NSDP inverse. The relationship between FDI in roads & bridges and road density is such that lesser the road density, higher will be the scope for FDI in roads & bridges, as the return for investment will be higher, resulting in a negative relationship. The relationship between FDI in roads & bridges and population density is such that higher the population density, there will be more pressure onto existing roads. Road congestion will increase as result of which, free flow of logistics will be at jeopardy. In order to cure this problem, more FDI in roads & bridges will flow into, resulting in a positive relationship. In order to see the impact of these factors on FDI in roads & bridges empirically, we regress FDI in roads & bridges onto these factors. Eviews 6 output, is as given below.

$FDI = ß_0 + ß_1*NSDP + ß_2*ARD + ß_3*PD + u$

Where, NSDP = per capita NSDP, ARD = Average Road Density and PD = Population Density

$\widehat{FDI} = 2655.345 – 0.009438 *NSDP – 8.740075 *ARD + 0.618869 *PD$

SE = (1147.176) (0.007305) (5.027775) (0.319622)

t = (2.314680)* (-1.291925) (-1.738358) (1.936254)

(F-Statistic = 1.365896) (R^2 = 0.506032)

Here we see that though every slope coefficient has their right sign but no slope coefficient is significant, which means that though during the study period 2004-2010, all the factors had their expected impact on FDI in roads & bridges, but the impacts were not significant. Thus we see from the results of the study period that the relationships between per capita NSDP and two key such policy variables as average road density and population density are such that if average road density increases, FDI in roads & bridges fall, if FDI in roads & bridges falls per capita NSDP increases and if population density increases, FDI in roads & bridges increases, if FDI in roads & bridges increases per capita NSDP falls.

Now, the Govt. has adopted various policy measures as well as offered special incentives, such as tax exemption, bearing the cost of project feasibility study, duty-free import of modern roads construction equipments etc., which are equally applicable for all the states across India. But, as a policy prescription, Govt. should differentiate these measures in accordance with the impact of the policy variables considered in this study on per capita NSDP to reduce inequality in regional economic growth.

6. CONCLUSION

From the above results, we see that significant disparity in regional economic growth exists, though between east & NWC region and east & south, but not between NWC region & south. Moreover, disparities in growth exist among regions but not among political affiliations. That is to say, growth does not enjoy any political affiliation premium. On the contrary, interestingly, political affiliation has some say in the east in making growth significantly different there from NWC region as well as south. However, in our study we have found FDI in roads & bridges to be statistically a cause of this disparity in regional growth. FDI in roads & bridges have varied across regions and this differential could be because of per capita income (measured in terms of per capita NSDP), average road density and population density (size of the region), of which average road density has greater impact on this disparity, though insignificant, during the study period 2004-2010. Thus we see from the results of the study period that the relationships between per capita NSDP and two key such policy variables as average road density and population density are such that if average road density increases, FDI in roads & bridges fall, if FDI in roads & bridges falls per capita NSDP increases and if population density increases, FDI in roads & bridges increases, if FDI in roads & bridges increases per capita NSDP falls.

Therefore common policy prescriptions adopted by the Govt. across all states in India should be complemented with a strategic discretionary policy measures, keeping in view the impact of the policy variables considered in this study on per capita NSDP to reduce inequality in regional economic growth, leading to all-inclusive growth for whole of India.

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