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Public and Private Investment in Road Infrastructure in India

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ABSTRACT

Developing nations require infrastructure to support growth and development. India has seen rapid growth in recent years. This study is an attempt to examine public and private sector investments in the road sector in India over the period 2005-2019 along with the contribution of the sector to the growth of the country. The main conclusion that can be drawn from the results is that during the period 2005 to 2019, the public sector invested more in roads, which resulted in the construction of longer roads, while private sector investments declined. In light of the results of this study, it is evident that the government is supporting an economy-critical sector through significant increases in road expenditures.

Keywords: Infrastructure, Road Sector, Public Investment, Private Investment

INTRODUCTION

The transportation sector plays a significant role in the growth, trade, and social integration of a country. Better transport improves the quality of life and livelihoods of billions of people by providing employment opportunities, markets, access to health care, and education. When transport costs fall, specialization is encouraged, the market size increases and economies of scale are created. The highly efficient transportation system has enabled supply chains and delivery systems to be more competitive. Transport involves moving people, and goods, from one place to another through the use of humans, animals, and vehicles. This type of movement occurs on land, on water, and in the air. Rail and road transportation are both forms of land transportation, while shipping, waterways, and airways are the other two. The pipelines transport liquid materials such as petroleum and natural gas. In comparison to other means of transportation, road transportation is more flexible, and accessible, and provides door-to-door service. There are two points within a geographical region that are connected by a road. In addition to transporting goods, roads also facilitate the movement of people. In India, roads are the backbone of the economy.

REVIEW OF LITERATURE

Many studies have been conducted on a variety of topics related to the road sector at the national and international levels over the course of time. The following section discusses a few of them in more detail. Deb (2000) conducted a study on private investment in the Indian transport sector during the post-reform period. The study found that infrastructure investment has unevenly distributed across sectors. The share of mining and quarrying decreased from 33 percent in 1990-91 to 18 percent in 1996-97, whereas the share of transportation, storage, and communication increased from 32 percent to 66 percent. Further, the study revealed that the focus in the transport sector has been on reducing energy intensity and developing an integrated multimodal system. This study shows that almost exclusively funds have been provided through the budgetary process for the road sector in India. The road sector has been steadily declining in plan outlays, and it's becoming increasingly apparent that budgetary support may not meet road infrastructure needs. Gurara et.al. (2018) analyzed trends in infrastructure investment and financing in low-income developing countries. infrastructure assets increased in LIDCs, although large gaps remain compared to emerging markets. The study found that most infrastructure in LIDCs is provided by the public sector, and the private sector is mainly involved through Public-Private Partnerships. Grants and concessional loans are major sources of infrastructure financing in LIDCs, and bank lending plays a limited role in these countries Tripathi and Gautam (2010), conducted a study on the relationship between road transport infrastructure and economic growth in India from 1999 to 2006. This study found that the entire growth in transport share in GDP has been attributed to the road transport sector, with the share of other modes remaining nearly constant during this period. Road transport has grown at a faster rate than other forms of transportation compared to other modes of transportation. Furthermore, the study found that vehicular traffic on roads has increased much more rapidly than on road networks.

OBJECTIVES OF STUDY

1.To assess the contribution of the road sector to the country's gross domestic productand its transportation sector.
2.To examine the trend of public and private investment in the Indian road sector.

DATA SOURCES AND TECHNIQUES

In this study, time series data is used to analyze the growth ofpublic and private investment in the Indian road sector. The study covered the period from 2005 to 2019. Secondary data is used in this study. The data relating to selected variables havebeen collected from various issues of the Economic Survey, the Road Transport Year Book, the Annual Report of the Ministry of Road Transport and Highways, and the Basic Road Statistics of India. In this study, the exponential growth model is used to analyze the growth.

RESULT OF THE STUDY

Roads are vital to any development agenda since they connect businesses with consumers, employers with employees, children with schools, and patientswith hospitals. Roads connect the urban and rural centers of the country. Rural areas produce agricultural products, which are consumed there and also transported to urban areas for consumption because urban centers do not produce agricultural goods. As a resultof such connectivity, backward areas can move forward and achieve equitable and inclusivegrowth. India's road transport systems are one of the most heavily used in the world, and it is the main mode of transportation for the majority of Indians. The world bank estimatesthat more than 60 percent of the country's freight and 85 percent of its passenger traffic aretransported by road. As of 1 December 2021, India has over 6,215,797 kilometers of roads. India has the world's second-largest road network, after the United States, with 6,645,709 kilometers. The country's road network consists of National Highways, State Highways, District Highways, Rural Highways, Urban Highways, and Project Roads. In terms of totalroad length, rural roads account for 71% of the total length of the roads, followed by districtroads 10% and urban roads 9%, project roads 5%, state highways 3%, and finally nationalhighways 2%. India's road network density is around 1.8 km per square kilometer. The density of the highway network in India is 0.66 kilometers per square kilometer of land, which is similar to the density in the United States of 0.65 kilometers per square kilometerof land. This is higher than China's 0.16, and Brazil's 0.20. Since 1951, the country's road network has grown substantially, from 3.99 lakh kilometers in 1951 to 62.16 lakh kilometers in 2021. The total road length of the country has increased significantly from 3.99 lakh km in 1951 to 62.16 lakh km in 2021. The number of kilometers of roads constructed per day increased from 28 km in 2019-20 to 36.5 km in 2020-21. Significant growth in road construction in 2020-21 resulted from an increase in government expenditure by 29.5 percent over the previous year. This shows the government's support for a crucial sector that provides employment opportunities for people. GVA is largely driven by road transport among various modes of transportation. In 2017-2018, the transport sector accounted for 4.77 percent of GVA, with road transport accounting for 3.06percent, railways accounting for 0.75 percent, air transportation accounting for 0.15 percent, and water transport accounting for 0.06 percent. With a GVA of 3.10 percent andgreater than 60% of the total transport sector, road transportation is the most important anddominant mode of transportation compared to rail, air, and water. Road transport is the dominant mode of transportation in terms of its contribution to Gross Value Added (GVA).

Table 1: Percentage Share of Different Modes of Transport Services in Gross Value Added (GVA)

Sector/year	2014	2015	2016	2017	2018
Road transport	3.28	3.26	3.12	3.05	3.1
Railways	0.18	0.82	0.77	0.75	0.73
Water transport	0.08	0.08	0.07	0.07	0.07
Air transport	0.05	0.06	0.16	0.15	0.1
Services incidental to transport	077	0.77	0.74	0.69	0.63
Transport sector	**4.99**	**4.99**	**4.86**	**4.71**	**4.63**

Source: Road Transport Year Book (2017-18 & 2018-19)

Table 2: Share of Road Transport in total Transport GVA

Year	Share of Road Transport in total Transport GVA (%)
2012	65.9
2013	65.3
2015	66.8
2015	64.5
2016	64.9
2017	64.4
2018	64.9
2019	67.0

Source: Economic survey,2021

Public and Private Sector Investment in Road Transport:

The roads sector has received a significant amount of investment in recent years. Compared to other sectors in the economy, this sector has developed a number of innovative public-private partnership models. Due to these factors, private players have made significant investments in the sector. The impact of road investments on the economy is multiplied because they create employment and increase incomes and thus have a multiplier effect. In general, National Highways are constructed using two types of models: Public funded projects and Public-Private Partnerships. In a Public-funded project, the government provides 100 percent of the funding. Different types of PPP models are also used for road development, such as BOT (Toll), BOT (Annuity), and Hybrid Annuity Model (HAM). Build-operate-transfer-BOT(Toll) refers to a public-private partnership model used for highway development. The developer of the road constructs the road and collects tolls to recover his investment. The majority of tolls are collected over nearly 30 years. For different types of vehicles, tolls are prescribed by the authority per vehicle per km. In most cases, this model is used for financing large infrastructure projects involving public-private partnerships. In Build-operate-transfer BOT(Annuity) model government pays all costs as deferred budgetary payments. Developers from the private sector received a fixed amount each year (called annuity) from the NHAI or state government without the obligation to collect traffic tolls. This model involves toll collection being handled by the government. In India, the third model used for developing the road sector is the Hybrid Annuity Model (HAM). In January 2016, the Government of India introduced the Hybrid Annuity Model. To address the shortcomings of previous public-private partnership models in road construction, the government has introduced this model. In previous models, many projects stalled and became monetary liabilities for the government. Construction support or grants of 40 percent of the Project Cost are provided by the government to private developers, while 60 percent is financed by the bidder who wins the contract during construction. It is the concessionaire's duty to pay back 60% as well as interest and operation and maintenance payments (O&M) in annuities over the operation period. The government is still responsible for collecting tolls. This model reduces the financial burden on private parties.

Investing in roads in India has been financed by budgetary support, internal and extrabudgetary resources (IEBR), and private sector investments. In 2018-19, budgetary support accounted for 48 percent of investments, and the IEBR accounted for 39 percent, while private investment accounted for 14 percent. Private investments in infrastructure have primarily taken the form of public-private partnerships (PPPs). The private sector has been slow to invest because investors are focusing on short-term investments, while public sector institutions such as NHAI and NHIDCL prefer long-term financing arrangements in order to deal with the long construction period. There is also the risk that the projected revenue streams from tolls may not be certain because of the uncertain traffic situation.

Table 3 : Public and Private Sector Investment in Road Transport (Rs.Crore)

Year	Private Sector Investment		Public Sector Investment		Total Investment in the Road sector
	Rs. Crore	Share in Total Investment	Rs. Crore	Share in Total Investment	
2005	649.08	4.60	13,446.79	95.40	14095.87
2006	1,578.28	8.92	16,116.59	91.08	17694.87
2007	7,062.40	30.25	16,281.22	69.75	23343.62
2008	8,184.73	29.06	19,983.24	70.94	28167.97

2009	8,572.54	30.36	19,661.87	69.64	28234.41
2010	15,354.37	36.13	27,140.50	63.87	42494.87
2011	25,998.56	41.97	35,951.71	58.03	61950.27
2012	20,304.66	42.70	27,245.53	57.30	47550.19
2013	22,515.05	38.07	36,619.48	61.93	59134.53
2014	19,232.44	35.01	35,702.27	64.99	54934.71
2015	29,770.00	30.07	69,218.06	69.93	98988.06
2016	16,028.64	17.37	76,275.26	82.63	92303.9
2017	16,500.64	13.83	1,02,852.38	86.17	119353.02
2018	21,605.00	13.59	1,37,353.53	86.41	158958.53
2019	25,000.00	15.82	133,000.42	84.18	158000.42

Source: Basic Road statistics in India, 2018-19 & Economic Survey 2020-21

Table 4: Growth Rate of Public and Private Investment in India 2005-2019

Variable	CAGR	Instantaneous Growth rate	Prob.
LOG(PVI)	20.50	18.65	0.0009
LOG(PBI)	18.62	17.07	0.0000
LOG(TIR)	18.37	16.86	0.000

Sources: Author's own calculation *PVI: Private Sector Investment in Road sector, PBI: Public Sector Investment in Road sector, TIR: Total Investment in Road Sector*

Based on the above table 4, it can be seen that there have been huge investments in the road sector by the public sector, which has gone from contributing 58 percent in 2011 to representing 84.18 percent in 2019 of the total road investment. Public investment in the road sector increased from 35,951.71 crores in 2011-12 to 1,37,353.53 crores in 2018-19. Private investments in total road investment increased from 41.97 percent in 2011 to 42.70 percent in 2012 but then fell to 13.59 percent in 2018. This indicates that the private sector's investments in the road sector have declined from 2011 to 2018 while the public sector's investment in the road sector has been increasing. During the period 2011 to 2019, public investments in roads increased by more than four times, which resulted in an increase in the length of the country's roads. The government has clearly supported a sector that is important for the country, provides jobs, and facilitates the development of infrastructure, as evidenced by the significant increase in road construction expenditures by the Government. Table 5 shows the growth rate of public and private investment in the Indian road sector from 2005 to 2019. Private investment in the road sector has increased at an annual rate of 18.65 percent from 2005 to 2019, and the compound average growth rate has been recorded at 20.50 percent. In the road sector, public investment has grown at an average annual rate of 17.07 percent between 2005 and 2019, and at a compound average rate of 18.62 percent. During the period 2005-2019, total investment in the road sector grew by 16.86 percent annually, with a compound average growth rate of 18.37 percent.

CONCLUSIONS

In the present study, efforts were made to examine the growth of private and public sector investment in India's road sector from 2005 to 2019. Time series data from secondary sources were used in this study. This study clearly indicates that private investment in the road sector grew faster than public investment from 2005 to 2019. In terms of share of investment, the public sector is more likely to contribute to the investment in roads than the private sector. Based on these results, it appears the government has significantly increased expenditures on road construction, which is crucial to the economy. For the development of the road sector, it is not possible to ignore private sector investment, so this study recommends the government should take some necessary steps to encourage private investment.

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