

# PPP INFRASTRUCTURE FINANCE: AN EMPIRICAL EVIDENCE FROM INDIA

Nagesha G<sup>1</sup> and K Gayithri<sup>2</sup>

## Abstract

*Financing of infrastructure is vital for the creation and maintenance of adequate infrastructure. The present paper has attempted to analyse various infra financing methods practised in India, namely, debt and equity capital, sources of debt and analyses of PPP (Public Private Participation) debt equity ratios. The empirical results reveal that in India, prior to the early 1990s the government predominantly financed infrastructure. Later, various government proactive measures welcomed private sector participation. This resulted in a decrease in the share of public investment and rapidly increased private investment, which could reach 50 per cent of the total infra-investment by the end of the 12<sup>th</sup> Plan. Further, the paper explains that financial patterns practised in the PPP are more of debt capital than equity. This has many limitations and this practice is not with the theoretical support and guidelines of SEBI and others. Further, the paper reveals that infrastructure debt is sourced mainly from the commercial banks, which has many restrictions and has resulted in slower growth of infrastructure investment than expected.*

**Keywords:** Infrastructure Finance, PPPs, Debt Equity Ratio

## 1. Introduction

The importance of infrastructure financing needs no reiteration. Traditionally, across the world, including India, governments have taken the sole responsibility to construct new infrastructure base, operate and maintain the same through budgetary allocations. Presently governments are facing financial constraints to fund infra needs adequately mainly due to fiscal stress arising out of rapid increase of their debt, rule-based fiscal norms, increased revenue expenditure and many more factors. Over the years, governments have been compelled to seek alternative modes of financing infrastructure. Inviting private equity capital was one of the major methods chosen by governments to finance rapidly increasing demand for infrastructure services. To invite private equity capital from domestic and foreign sources, the government created a friendly environment with various investor-friendly institutions, policies and schemes. Further, the government created room for joint ventures by creating various special purpose vehicles (SPVs), debt funds, attractive infrastructure bonds and many more measures to meet adequately the increasing financial requirements to create and maintain infrastructure services.

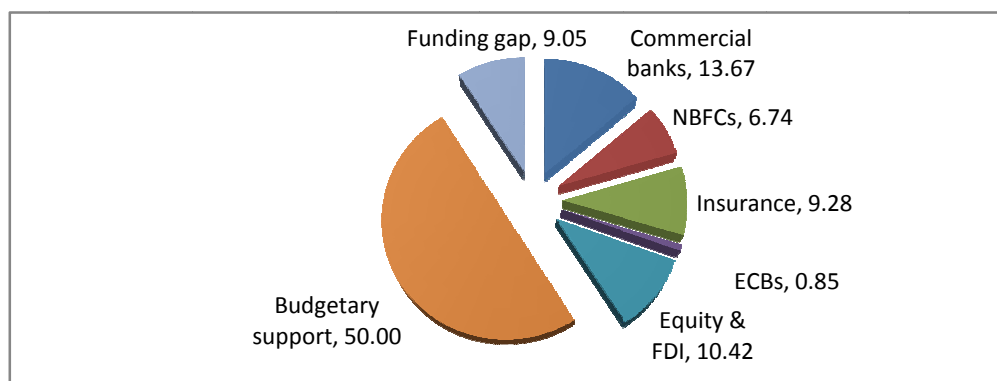
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Note- This Paper is the part of broader doctoral research work

**Chart 1: Summary Various Sources of Infra Finance for 12<sup>th</sup> FYP**



**Note:** values are per cent of total of projected infra investment for 12<sup>th</sup> FYP (₹ 65,00,000 crore)

**Source:** Working sub-group on infrastructure, 12<sup>th</sup> FYP, Planning Commission, GOI.

The Planning Commission has estimated that on an average 10 per cent of GDP invested in the infrastructure sector would sustain higher GDP growth during the 12<sup>th</sup> Plan. In nominal terms, this would amount to ₹ 65 lakh crore at 2006-2007 prices. The 12<sup>th</sup> Plan working sub-group on infrastructure (Chart 1) estimated that around 50 per cent of total funds would to be raised from budgetary sources (including Centre and States) and around 41 per cent of the total investment was expected from commercial banks, equity and foreign direct investment, insurance, NBFCs and ECBs at 14, 10, 9, 7 and 1 per cent respectively. Further, the remaining 9 per cent was mobilised through the following measures: First, bringing regulatory reforms in insurance and pension funds to channelise more funds to infra investment; second, ensuring more flow of funds from ECBs and FDI; third, developing various financial products and markets to meet the requirement, which include reforms in commercial banks' lending norms for the infrastructure sector; and fourth, expanding the Indian bond market exposure to finance infrastructure.

It is vital to understand that funds shortage in infra PPP in India is mainly attributed to massive requirements (US\$ one trillion for 12<sup>th</sup> Plan period), inadequacy of government and private developers to meet such massive demands for funds through equity, difficulty of financing through debt capital due to limited sources and absence of capital market development.

The paper is organised in the following order. Section 2 explains the sources and processes of infrastructure financing in India. Section 3 focuses on the debt equity ratio analysis of the select infra PPP projects, Section 4 explains the challenges of infrastructure financing in India. The summary and policy suggestions to address the present challenges of infrastructure financing in India in Section 5 form the concluding part of this study.

## 2. Infrastructure PPPs Financing in India:

To finance infrastructure projects both in item rate contracts<sup>3</sup> (IRC) and engineering procurement construction (EPC) contracts, the government has to finance the project in real-time either through budgetary sources or internal or external debt capital. Fiscal constraints of the governments, increase time and cost overrun of the IRC infra projects and government's willingness to harvest the private sector's financial resources and managerial efficiency resulted in governments' move to invite private sector investment in infrastructure projects. The Public Private Participation (PPP) method has been a widely practiced strategy across the world since the 1980s. In the standard PPP model (BOT, BOOT, DBFOT, BOO) government hands over the construction, operation and maintenance of the infrastructure project to the private developer/SPV. In PPPs, the developer/SPV opts for a feasible financial model to develop the respective project. Financing methods practised in India's infrastructure are explained below.

- A. Equity:** In PPP, equity refers to the financial investment by the concessionaire/SPV from own capital. This capital will partially meet the construction and/or operation expenditure of the respective project. In some projects, governments will also join the SPV equity capital. The returns on the investments of the developers will be paid by way of regular annuity or user fee/toll over the concession period, which is normally the estimated breakeven point - when the concessionaire will be in a position to recover all the expenditure incurred with normal expected rate of return. In-depth discussion on the equity capital of the select PPPs will be analysed in the section on debt equity ratio analysis.
- B. Debt:** Debt is another vital source of PPP infrastructure finance in India. Infrastructure projects demand massive financial investment, which is difficult for developers/SPV to mobilise only through equity capital. Hence, debt capital and equity capital fund these projects. The principal sources of debt capital used by the Indian infra projects are explained below.

### Sources of Infrastructure Debt:

**Banks:** In the post reform period, banks became the vital sources of debt finance for PPP infrastructure projects in India. Credit disbursement to infrastructure as a per cent of non-food credit increased from 1 per cent in 1998 to 12.37 per cent in 2013 (cumulative increase). In absolute terms, total bank credit to the infrastructure sector in India increased from ₹ 7,243 crore in 2000 to ₹ 8,39,780<sup>4</sup> crore in 2014 (Table 5.1). Chart 2 shows that the banks' financial support to infrastructure expanded several fold during last 15 years. Bank credit to infrastructure increased from 1.42 per cent to 12.17 cumulative per cent during FY00 to FY13. Incremental increase of bank credit to the

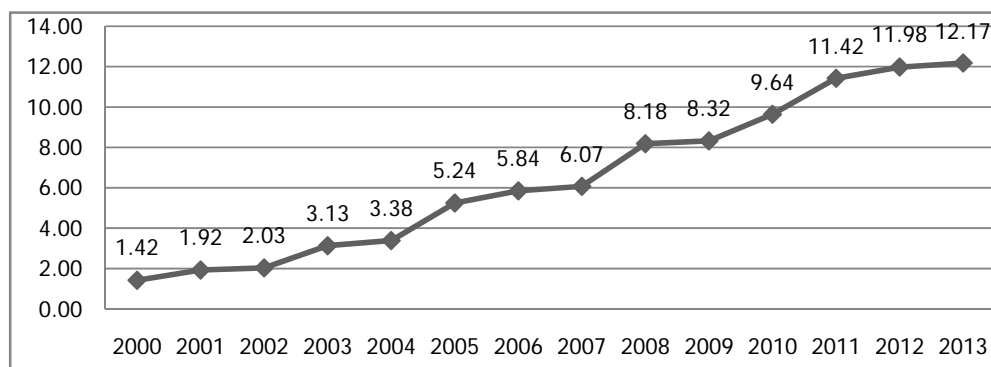
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<sup>3</sup> IRC is a traditionally used common form of contract, where the contractor procures all the required materials and constructs the respective structure by himself or through sub-contractor; for this government has to pay on the real-time basis.

<sup>4</sup> From RBI database as on march 21, 2014

infrastructure sector has been declining continuously since 2009, and the decline has been more intense in FY12 and FY13, i.e., just .56 and .20 per cent respectively.

**Chart 2: Infrastructure Credit % to Total Bank Credit**



**Source:** Authors' compilation from various RBI documents.

Table 1 illustrates that bank credit to infrastructure is not unique to the reference period. Cumulative growth declined to 15 per cent in 2014 from a peak of 112 per cent in 2005. Further, the analysis reveals that the impact of the economic crisis on the flow of funds to infrastructure was very significant; during the post crisis period (2009-14) the growth of credit declined by more than 50 per cent (cumulative average growth 24.8 %), which was 56 per cent during the pre-crisis period (2000-08).

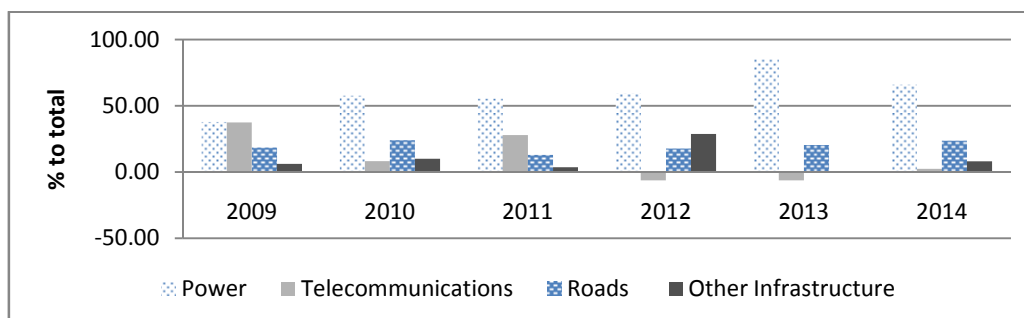
**Table 1: Gross Bank Credit to Infrastructure Sector**

Outstanding as of March	Infrastructure	Power	Telecommunications	Roads
2000	7243	3289	1992	1962
2001	11349 (56.7)	5246 (59.6)	3644 (83)	2459 (25.4)
2002	14809 (30.5)	7373 (40.6)	3972 (9.1)	3464 (40.9)
2003	26297 (77.6)	15042 (104.1)	5779 (45.5)	5476 (58.1)
2004	37224 (41.6)	19655 (30.7)	8408 (45.5)	9161 (67.3)
2005	78999 (112.3)	38235 (94.6)	15705 (86.8)	15500 (69.2)
2006	112853 (42.9)	60157 (57.4)	18455 (17.6)	19695 (27.1)
2007	143375 (27.1)	73158 (21.7)	19446 (5.4)	24984 (26.9)
2008	227038 (58.4)	108174 (47.9)	34220 (76)	39123 (56.6)
2009	269972 (19)	124447 (15.1)	50326 (47.1)	47060 (20.3)
2010	379888 (40.8)	187841 (51)	59362 (18)	73569 (56.4)
2011	526611 (38.7)	269196 (43.4)	100425 (69.2)	92569 (25.9)
2012	629991 (19.7)	330926 (23)	93995 (-6.5)	110941 (19.9)
2013	729721 (15.9)	415849 (25.7)	87765 (-6.7)	131312 (18.4)
2014	839780 (15.1)	488346 (17.5)	90393 (3)	157399 (19.9)

**Note:** 1) Values are in ₹ crore. 2) Values in the parenthesis cumulative growth 3) Data on sectoral disbursement of credit includes 47 SCBs, which accounts for 95 % of total disbursement.

**Source:** Authors' estimation from Handbook of statistics on Indian Economy, RBI 2006 and RBI database 2014.

**Chart 3: Infra Sub-sector-wise Disbursement of Bank Credit**



**Source:** Authors' estimation from RBI database 2014.

A review of sector-wise average growth of gross bank credit to the infrastructure sectors reveals that the power sector accounts for the highest share, which is 53 per cent of total infra-sector lending. Roads, telecommunications and other infrastructure sectors accounted for only 18, 15 and 14 per cent respectively in 2000-2014. In infra finance, the share of public sector banks is quite high.

### **Debt from International Financial Agencies:**

Governments at the national and sub-national levels borrow funds from various international financial institutions to fund infrastructure projects. Governments have borrowed funds from the World Bank, Asian Development Bank and Japan Bank for International Co-operation. The advantage of borrowing from these entities is typically the long tenure of repayment, marginal rate of interest and large inflow of foreign currency, a positive impact on balance of payments and the facility to import essential equipment required for the execution of infra projects. It is vital to acknowledge here the magnitude of funds that flow from these agencies, the cost of funds and its impact on the growth of the infra sector. However, non-availability of data on these aspects makes it impossible to undertake such an exercise presently.

### **Issues in Commercial Bank Lending to Infrastructure:**

**Cost of debt:** Generally, commercial bank financing to infra projects is costlier than other sources of finance (bond/equity capital). The cost of debt is rapidly increasing, presumably due to commercial banks' financing, which in turn is because commercial banks fully or partially borrow funds through refinancing institutions/bank syndicate or takeout financing procedure. In addition, factors like incidence of risk premiums, hedging in case of foreign currency loans to avoid currency fluctuations, high transaction cost etc., results in increasing the cost of bank funding. This problem of high cost of commercial bank debt is one of the vital constraints on Indian infrastructure finance. There is a need for alternative funding sources to infrastructure to address the high cost of debt.

**Asset liability incompatibility:** Commercial banks receive short term to medium term deposits, which generally ranges from less than a year to 5 years in fixed deposits and much shorter periods for savings bank accounts. Infrastructure projects require long term loans because revenue generation

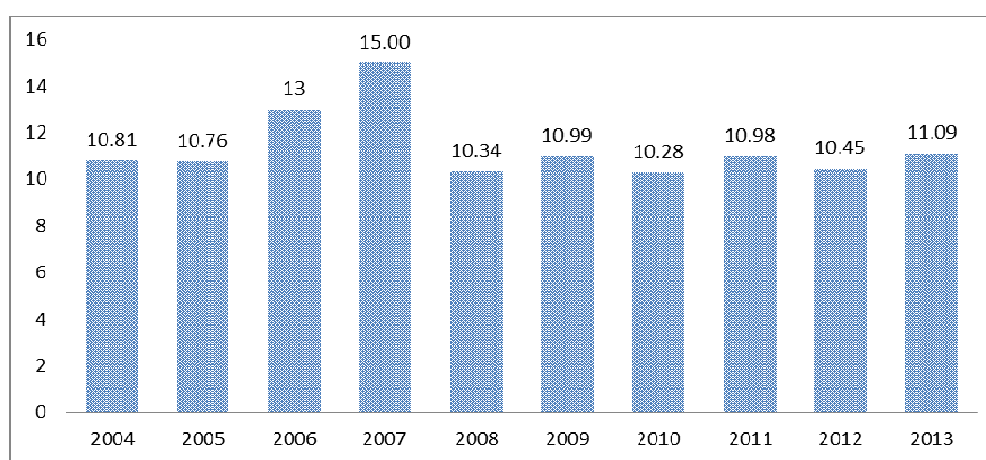
requires long tenure (whole life of the project), typically between 25-30 years. It is difficult for commercial banks to lend such long term loans due to the relatively shorter period deposits it accepts. To address the asset liability mismatch of the commercial banks, the Reserve Bank of India<sup>5</sup> (July 2014) brought out new guidelines<sup>6</sup> for infrastructure loans. This new scheme of the RBI allows 4 or 5-year tenure loans to meet 80-85 per cent of the project concession period/lifespan, which is normally 25-30 years. This way, the problem of asset-liability imbalance of infra projects is sought to be addressed. Towards this end, the RBI suggested that the initial loan to mega infra projects be sanctioned for a period of 5-7 years. This should normally meet the expenses of construction and other expenses up to the start of commercial operations. Once the tenure of the loan ends, the respective banks may request the debtor/developers for bullet repayment of outstanding loans by means of new loans from the same or new lender or combination of both or even through corporate bonds.

In addition, the RBI has directed commercial banks to activate the repayment schedule of such infrastructure loans from the time of revenue generation instead of from the day of loan sanction, which normally happens after commercial operation of the project begins.

### Insurance Sector Finance to Infrastructure:

The Indian insurance sector is broadly classified into public and private sector companies. Further, public and private sector insurance companies are classified into life and non-life insurance companies. In the public sector, the Life Insurance Corporation of India (LIC) is the only institution providing life insurance coverage, while four other firms, viz., National, New India, Oriental and United India are into general/non-life insurance. In the private sector, 23 companies in life and 17 in non-life insurance (Exhibit 1 in annex) are operating.

**Chart 4: Insurance Sector Share in Total Infra Investment in India**



**Source:** Compiled from various annual reports of IRDA

<sup>5</sup> RBI/2014-15/126, DBOD.No.BP.BC.24/21.04.132/2014-15 July 15, 2014, [www.rbi.org.in](http://www.rbi.org.in)

<sup>6</sup> It is known as 5:25 scheme; which provisions banks to reframe the infra sector debt every five years to address the asset liability mismatch problem and this scheme allows for all the existing infra commercial bank loans too.

As Chart 4 illustrates, 11.37 per cent (average annual disbursement) of insurance sector funds became infrastructure investment in India from 2004 to 2013. In the pre-crisis period, the average flow of funds was around 12.27 per cent, which reduced significantly to 10.69 per cent during the post-crisis period. The volume of reduction in the flow of insurance funds to infrastructure attributed to the crisis is about 1.6 per cent of total investment.

The issue of insurance funds financing infrastructure is further examined by desegregating inflows between life and non-life insurance segments. Public sector insurance companies in life and non-life categories account for more investment compared to private sector companies. Average flow of funds to infrastructure investment from life insurance groups accounted for 94 per cent of the total and 6 per cent was from the non-life insurance groups during 2006-2013. Further, during 2006-2013, the funds from LIC, the public sector life insurer accounted for 90 per cent and the four public sector non-life (general) insurance companies accounted for 4.5 per cent. Funds from private insurance companies accounted for just 5.67 per cent (4.07% life + 1.6 % non-life) of the total in the same reference period.

An empirical analysis reveals the predominant position of public sector insurance companies in infrastructure financing in India.

### **Pension and Provident Funds:**

One of the potential areas to harvest funds for infra needs is pension and provident funds. One of the vital benefits of this source is the availability of long tenure funds. Further, these funds will create a win-win situation for both lenders and borrowers when properly employed. The individual (pensioner or PF member) expects good returns on investment and the borrowers expect long tenure cost-effective funds. Hence, the government needs to explore all the possibilities to exploit the massive resources of this sector.

### **Bond Market:**

Another potential source of long tenure funds for infrastructure needs is the bond market. Government has already launched various schemes for raising funds for infra financing, and harvesting the bond market is also one of the emerging sources of infra finance in India. Through its agencies, like IIFCL, NHAI etc., Government of India issues bonds and raises funds either for direct lending to mega projects or refinance banks' infrastructure debts. In India, the bond market accounts for around 5 per cent of total infra finance needs; this is quite modest compared to that in many countries, and, hence, there is enormous scope to exploit this sector to meet the massive infra finance needs.

The bond market in India is not very popular owing to the limited range of capital market, fewer participants, absence of attractive schemes to attract the investors, low rate of returns, etc. These factors come in the way of tapping the bond market to meet the rapidly increasing demand for infrastructure finance in India. The government in general, and SEBI in particular need to bring reforms by means of innovate and lucrative methods to harvest funds through the bond market (from domestic and foreign sources) to meet the huge financial needs of the infra sector. The 12<sup>th</sup> FYP working sub group of infrastructure has also suggested developing and consolidating the Indian bond market.

### 3. Debt Equity Ratio<sup>7</sup> (DER) in Infrastructure PPPs:

As one of the important financial aspects in PPPs, there is a need to understand debt equity ratio to identify the optimal capital structure<sup>8</sup> of the firm. This will determine the cost of capital. In PPPs, the cost of capital is important to determine value for money (VfM) to all the stakeholders. Finding the optimum debt-equity ratio may be one of the techniques to determine the cost of capital, which in turn will influence the toll/user fee or the annuity payments of the government. There is an argument that higher the equity, lesser the pressure and risk for the private sector. If the proportion of debt finance increases in the capital structure of the PPP firm, then there may be more pressure on the company to pay the debt as soon as possible and may influence increase in the cost of the capital through heavy interest payments. This ratio analysis technique is also widely used in the literature as one of the important techniques for predicting possible bankruptcy of the firm in question. So, one needs to analyse the capital structure of the PPPs to observe whether the PPPs follow the optimal capital structure or not.

#### Review of Theories on Debt Equity Ratio:

Net operation income (NOI) and the Modigliani Miller (MM) approach express the views that debt is a relatively cheaper source of funds compared to ordinary shares. However, it may result in increased financial risk and the firm viewed as risky by creditors who like higher returns. It makes the company assets illiquid and the firm could become bankrupt. Consequently, the use of debt beyond a certain point will raise the weighted average cost of capital and, conversely, the total value of a firm.

The traditional approach of the Optimum Capital Structure theory explains that the marginal cost of debt must include both implicit and explicit costs of debt. This may be equal to the real cost of equity. Up to a certain level of debt equity ratio, the marginal real cost of debt would be less than that of equity capital. Beyond level of advantage, the marginal real cost would exceed that of equity. The cost of capital may be cheaper if we do not consider the implicit cost. Accordingly, one should take into account the explicit as well as implicit costs while determining the cost of debt. This concept of cheaper cost of debt will not exist if we consider both explicit and implicit costs. Finally, the traditional theory argues for judicious use of debt equity proportions.

Investopedia<sup>9</sup> explains, "A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense." It explains further that the debt/equity ratio depends on the nature of industry in which the company operates, i.e., more capital intensive industries may opt a debt/equity ratio above 2, whereas, less capital intensive industries like personal computer companies need debt/equity under 0.5.

The Security and Exchange Board of India (SEBI) authorises a company for capital issue (IPO) based on the optimum debt equity ratio, i.e., 2:1 ratio. (Gupta *et al.*, 2006).

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<sup>7</sup> Debt equity ratio: is the ratio of total liabilities to the equities. (Total liabilities/total equity)

<sup>8</sup> Optimum capital structure is the capital structure at which the weighted average cost of capital will be minimum and thereby offer maximum value to the firm.

<sup>9</sup> <http://www.investopedia.com/terms/d/debtequityratio.asp#ixzz1uwYVYgN6>

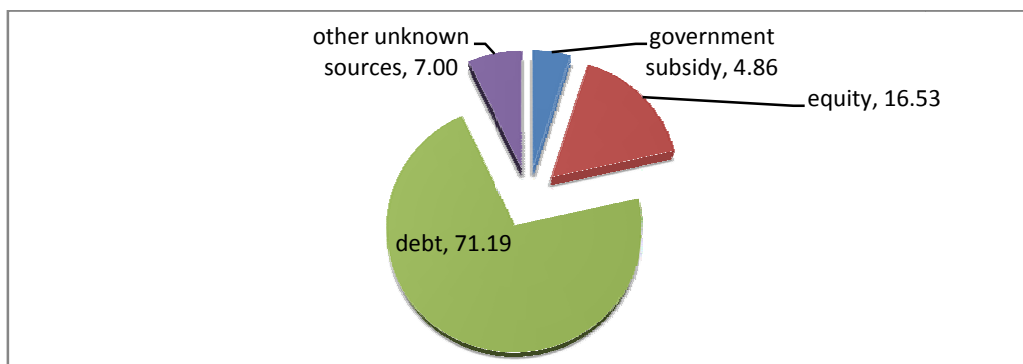


The working sub-group on infrastructure<sup>10</sup> points out that the current regulatory norms for insurance companies to finance infrastructure projects, as specified by the Insurance Regulatory Development Agency (IRDA), suggests, “Provide debt/loan investment in infrastructure companies to the extent of 25 per cent of the project equity/capital employed, which in real terms works out to only 5 to 8.75 per cent of the total project cost depending on the equity brought in by the promoters.” It also suggests, “Debt equity ratio must range between 65:35 and 80:20 (p.22).”

### Methodology:

This study attempts to analyse the pattern of debt and equity capital in Indian infrastructure PPP projects. To carry out the exercise the author utilises the PPP database provided by the Finance Ministry, GOI (2014)<sup>11</sup>. The database provides information on 832 PPP projects. It is found from a review of all the 832 project details that the debt-equity data is helpful only for 99 projects. Hence, the present study limits the analysis to 99 projects to gain insight into the pattern of debt equity ratio of infra PPP projects. The conclusions of this limited analysis, presumably, will help get insight into the financial situation of other projects also. The total project cost (TPC) of the 99 infra PPP projects amounts to ₹ 4,144.87 crore. As illustrated in Chart 5, of the total TPC, 5 per cent (₹ 2,011.52 crore) is financed through government subsidy, around 17 per cent (₹ 6,845.69) through investors’ equity, 71 per cent (₹ 2,9488.59) from debt capital and the rest from unknown sources.

**Chart 5: Financing Structure of Select Infra PPPs**



**Source:** Compiled from DEA, GOI, 2014

The DER of the 99 projects under review ranges from 0.6 to 9, with an average of 2.78. An important and alarming factor is that in 70 projects the debt-equity ratio is more than 2:1. Analysis also reveals that this ratio is not unique across the projects, sectors and States.

Chart 6 illustrates the differences in the debt equity ratios of the projects under review. The ratio is not unique across the various infrastructure sub-sectors. Urban development PPPs have the

<sup>10</sup> Working Sub-Group on Infrastructure, Planning commission, GoI, “Infrastructure Funding Requirements and its Sources over the implementation period of the Twelfth Five Year Plan (2012- 2017)”.

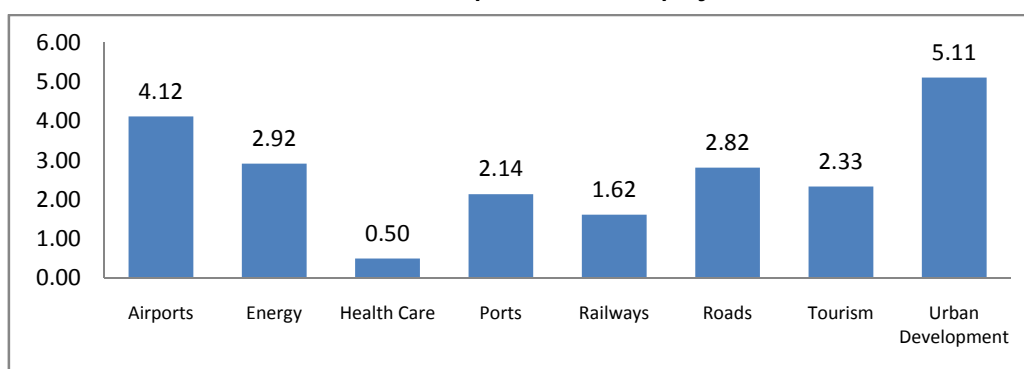
<sup>11</sup> Department Economic Affairs, Ministry of Finance, Government of India (2014), provided the database of infrastructure PPPs under Right to Information (RTI).

highest DER of 5.11, followed by airport PPPs with 4.12. The energy and road sector projects appear as having a similar ratio of around 3, while the healthcare sector PPPs have the lowest DER of .50.

This ratio is much above the guidelines suggested by both SEBI and Investopedia. Thus, one should be aware of the risk of illiquid highly risky projects, which may possibly widen the government's contingent liabilities. This analysis reveals that the capital structures of selected Indian PPPs are not strictly following the optimal capital structure norms.

The possible reasons behind the differences in DER could be differences in the TPC. With increase in TPC, there is more chance of higher DER and vice versa. In addition to TPC, project risk is another possible factor that determines the ratio. The DER will be high when the project risk (construction as well as operation) increases. Further, many more factors like competition among the investors, assured returns to the investors, project gestation period, availability of funds with the investors and provision of bank finance will determine this ratio. Due to paucity of data on these vital factors, it is difficult to analyse these possible factors even through rigorous statistical methods at present. .

**Chart 6: Sectoral Spread of Debt-Equity Ratios**

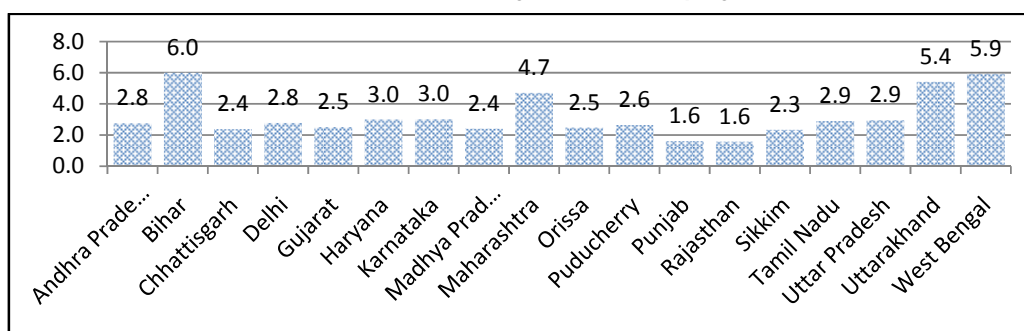


**Note:** sample of total 99 PPP projects

**Source:** compiled from DEA, GOI, 2014.

## Regional Spread of DER:

**Chart 7: State-wise Analyses of Debt Equity Ratios**



**Note:** sample of total 99 PPP projects

**Source:** compiled from DEA, GOI, 2014

The study further analyses the DER of the selected projects region-wise. Chart 7 provides the State-wise distribution of DER of the PPP projects. Bihar, West Bengal and Uttarkhand have the highest DER ratios of 6, 5.9 and 5.4, respectively. This possibly could be because of the respective States' stressed fiscal health and needs exploring. Interestingly, the results reveal that almost 11 States (Sikkim, Chhattisgarh, Andhra Pradesh {undivided}, Madhya Pradesh Gujarat, Orissa, Uttar Pradesh, Karnataka, Haryana, NCT Delhi and Puducherry) have almost similar DER ranging between 2.5 and 3.

The draft report of the study by the PWC (2007) on infrastructure PPPs financing in India reveals that there is an increase in debt to equity ratio in the Indian infrastructure PPPs. It points out that the ratio did increase from 2.1 to 4.3 during 2002-2006. These empirical results reveal that there is a larger dependence on debt by the developers and it also evident that share of equity capital of investors is continuously declining; this may be because of existence of only a few developers. Hence, the government needs to attract new players from international and domestic markets through policy intervention and create a more investor friendly environment to reach the slated target (50% of total infrastructure investment by private sector, which is around US \$ 500 billion) of the 12th plan.

The swift increase in debt equity ratio is a sign of growing dependence on debt by the developers for future PPP investment projects. On the other hand, commercial banks' exposure to infrastructure credit has almost reached the optimum level. Increasing cost of debt, delay in land acquisition, and many more factors have resulted in almost stagnation in execution of new PPP projects post-2012 in India. Absence of developers to bid for new projects is another reason for not taking up new PPPs. Exceptions to the rule are projects in the pipeline, which have increased. Many projects that had reached financial closure are cancelled for one reason or other. Therefore, the government should address the non-availability of funds to the developers immediately. Attracting pension and provident funds and more insurance funds to the infra sector is urgently needed.

#### **4. Challenges of Infrastructure Financing in India**

To meet the present day infra requirements, there is a need for innovative methods of infra financing. This may include bringing pension funds and long term institutional financial assistance by NBFI/Cs. There is also a need to streamline existing methods to make investment in the infra sector more attractive. Expansion of the bond market is very important for governments both at national and regional levels in to counter the present day challenge of inadequate funds for infra finance.

The CAG (2014) revealed that enormous amounts of surplus funds are idle with the NHAI, which were mobilised by issuing tax saving bonds. This is due to unscientific method of raising funds without a proper plan of actual fund requirement; this needs to be addressed in the future.

#### **5. Summary**

This study has attempted to analyse the financing of infrastructure projects in general and PPPs in particular with respect to debt-equity ratio analysis. Based on the empirical analysis, the study reports the following conclusions:

India's infrastructure finance is predominated by government investment. During Tenth FYP the total share of government investment in infra finance was around 90 per cent; later in the 11th Plan the public sector share declined to 65 per cent and in the present 12<sup>th</sup> FYP, it is expected to decline further to 50 per cent. Increase in private investment, largely financed by debt capital, comes from commercial banks and insurance companies. Further, the study found that public sector schedule commercial banks and government insurance companies dominate India's infrastructure credit with a share of more than 85 to 90 per cent.

The two important findings emerging from the analysis are: 1) There is need and large scope for optimising the present infrastructure financing sources. In addition to garnering more funds from the insurance sector, government has to harvest provident and pension funds for infra financing in India. Further, there is large scope for exploring the capital market through issue of innovative bonds on a much larger scale. 2) Ensure proper deployment of funds. It is common knowledge that raising funds is a primary condition. However, the CAG report reveals that massive funds raised through tax saving bonds remain unutilised. These funds are partially with the NHAI and the rest of parked in fixed deposits with banks. Hence, the present study strongly suggests that there is a need for an appropriate and scientific road map for the computation and disbursement of annual/quarterly financial requirements.

Further, this analysis has proved that escalating DER is yet another alarming factor in financing India's PPPs projects. The mounting debt ratio will increase the cost of capital. This phenomenon forces the private developer to repay the debt quickly and shift this burden to the users by means of user fee/toll. This has potential to adversely affect the public/user and trigger agitation against the project. In the end, this may lead to increased government liability too. Hence, there is urgent need for government policy intervention in this regard to fix the maximum limit of debt ratio in the PPP projects. Government would do well to consider the suggestions of the expert committee and fix appropriate ceiling for various sub-infra sectors depending on the intensity of capital requirements and other relevant factors.

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## References

- CAG (2009). *PPPs in Infrastructure Projects- Public Auditing Guidelines*. New Delhi. : Comptroller and Auditor General of India .
- (2014). *Implementation of PPP projects in NHAI. Performance Audit, No.36*. New Delhi: CAG.
- IRDA (2015). Insurance Regulatory and Development Agency, various annual reports. Retrieved from [www.irda.gov.in](http://www.irda.gov.in).
- GOI (2000). *Public Private Partnership Assessment, Public Private Partnership Guidance Note 4; Department of the Environment and Local Government*. Retrieved from <http://www.envron.ie/en/Publications/DevelopmentandHousing/PPP/FileDownload>
- (2014). *PPP Database*. New Delhi: Department of Economic Affairs, Ministry of Finance, Government of India.

Maniar Hiren (2013). Sceranio of VGF concept in Indian Infrastructure projects. *Journal of Infrastructure Development*, 33-65.

PWC (2007). *Draft Final Report on Infrastructure Public Private Partnership (PPP) Financing in India*. Price Water House Coopers.

RBI (2014). *RBI.org.in*. Retrieved October 20, 2014, from [http://www.rbi.org.in/scripts/BS\\_PressReleaseDisplay.aspx?prid=27137](http://www.rbi.org.in/scripts/BS_PressReleaseDisplay.aspx?prid=27137)

## Annex

**Exhibit 5.1: List of Private insurance companies**

Life Private		Non-Life Private	
1.	Aegon Religare	1.	Bajaj Allianz
2.	Aviva	2.	Bharti Axa
3.	Bajaj Allianz	3.	Cholamandalam MS
4.	Bharti Axa	4.	Future General
5.	Birla Sunlife	5.	HDFC ERGO
6.	Canara HSBC	6.	ICICI Lombard
7.	DLF Pramerica	7.	IFFCO Tokio
8.	Edelweiss Tokio	8.	L&T General
9.	Future Geneali	9.	Liberty Videocon
10.	HDFC Standard	10.	Magma HDI
11.	ICICI Prudential	11.	Raheja QBE
12.	IDBI Federeal	12.	Reliance
13.	India First	13.	Royal Sundaram
14.	ING Life	14.	SBI General
15.	Kotak Mahindra	15.	Shriram
16.	MAX Life	16.	TATA AIG
17.	PNB METLIFE	17.	Universal Sampo
18.	Reliance		
19.	Sahara		
20.	SBI Life		
21.	Shriram Life		
22.	Star Union DAI_ICI		
23.	Tata AIA		

**Source:** Compiled from IRDA annual report 2012-13