A STUDY ON ESTIMATION OF INVESTMENT REQUIREMENTS IN INDIAN HIGHWAYS SECTOR AND THEIR DETERMINANTS

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Abstract :

Sources of investment or fund in the gigantic work that is taking place in Indian highways sector is a burning issue for quite some time. Apart from the modalities like PPP etc, what factors attract the investors in this regard is a relevant question both to the awarding authority as well as the awardees. At the same time, what may be the possible quantum of investment in highways sector at present as well as near future is a pertinent question. The study aims at determination of investment requirements in Indian highways sector at present and the most significant factor(s) which is the driving force for award of a contract in this sector.

Keywords: *National Highways, NHDP, Investment in Roadways sector, Financial close.*

Introduction

The total road length in India increased more than 11 times during the 60 years between 1951 and 2011. From 399 thousand kilometer as on 31st March 1951, the road length increased to 4.690 million kilometers as on 31st March 2011. Interestingly, the surfaced road length has increased both in absolute and relative terms. The length of surfaced roads which was 157 thousand kilometers (39.35 per cent of total road length) as on 31st March 1951, increased to 2.525 million kilometers (53.83 per cent of total road length) as on 31st March 2011.

Major infrastructure development requires a substantial inflow of capital investment. The policies of the Indian government encourage investments in the domestic infrastructure, both from local and foreign private players. FDI inflows in construction (infrastructure) activities from April 2000 to June 2013 stood at USD 2200 million according to Department of Industrial Policy and Promotion (DIPP). In order to increase FDI inflows to further boost investments in the areas of infrastructure, the Indian Government has introduced significant policy reforms. Infrastructure industry includes roads, power, railways, urban infrastructure, irrigation and others. Road sector is the key contributor in the overall investments undertaken in the infrastructure industry.

In the Eleventh five year plan (2007-08 to 2011-12), the actual investments in the infrastructure sector reached Rs 19.5 trillion as against budgeted investment of Rs 20.6 trillion (95 per cent achievement level). The key drivers were: increased focus of central government on improving the infrastructure, against which several programmes were undertaken by the government.

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Literature review

NHAI was established under the National Highways Authority of India Act, 1988 but became operational in February 1995. The Authority is an autonomous body with executive responsibility for the development, maintenance and operation of those National Highways and associated facilities vested in it by the Ministry of Surface Transport. It is decided to take over the management of the entire National Highways on agency basis in a phased manner. The Authority has been entrusted with the execution of the highway projects under Asian Development Bank (ADB-III) as well as Original Engineering Consultants (OEC-III). In addition, NHAI will implement other externally aided projects like World Bank-III and maintenance thereof. NHAI will also be responsible for implementation of the policy of privatization in highway sector.

The National Highways Authority of India (NHAI) is mandated to implement the National Highways Development Project (NHDP). Most of the projects have been developed or are under development on Public Private Partnership (PPP) basis through Build Operate and Transfer (BOT)-Annuity and BOT-Toll mode. Typically, in an annuity project, the project IRR is expected to be 12-14% and equity IRR would be 14 -16%. For toll projects, where the concessionaire assumes the traffic risk, the project IRR is expected to be around 14-16% and equity IRR around 18-20%. NHDP is one of the largest road development programmes to be undertaken by a single authority in the world and involves widening, upgrading and rehabilitation of about 55 thousand km, entailing an estimated investment of INR 3000 billion (USD 60 billion).

The NHDP is being implemented under several phases:

Phase I mainly involve widening (to 4 lanes) and upgrading of 7,498 km of the national highway network and has four component packages:

1. Highway network linking the four metropolitan cities in India i.e. Delhi-Mumbai-Chennai-Kolkata, covering a length of 5,846 km, popularly known as the Golden Quadrilateral (GQ) project.
2. Highways along the North-South (NS) and East- West (EW) corridors, covering a length of 981 km
3. Port connectivity projects covering a length of 356 km; and
4. Other highway projects, covering a length of 315 km

Phase-II involves widening and improvement of the NS-EW corridors (not covered under Phase-I) covering a distance of 6,647 km, besides providing connectivity to major ports on the east and west coasts of India and some other projects. This includes 6,161 km of NS-EW corridors and 486 km of other highways. The total length of the NS-EW network under Phases I & II is about 7,200 km. Phase II was expected to be largely completed by December 2010.

Up gradation of 12,109 km (NHDP-III)

NHDP-III involves up gradation of 12,109 km (mainly 4-laning) of high density national highways, through the BOT mode at a cost of INR 806.26 billion. The project consists of stretches of National Highways carrying high volume of traffic, connecting state capitals with

the NHDP network under Phases I and II and providing connectivity to places of economic, commercial and tourist importance.

2-laning of 20,000 km with paved shoulders (NHDP-IV)

With a view to providing balanced and equitable distribution of the improved/widened highways network throughout the country, NHDP-IV envisages upgrading of 20,000 km of such highways into 2-lane highways, at a cost of INR 278billion (USD 5.6 billion). This will ensure capacity, speed and safety match minimum benchmarks for these national highways. The government has already approved strengthening of 5,000 km to 2-lane paved shoulders on BOT (Toll/ Annuity) under NHDP-IV A at a cost of INR 69.50 million (USD 1.4 billion).

6-laning of 6,500 km (NHDP-V)

Under NHDP-V, 6-laning of the 4-lane highways comprising the GQ and certain other high density stretches, will be implemented on BOT basis at an estimated cost of INR 412.1billion (USD 8.2 billion). These corridors have been 4-laned as part of the GQ in Phase-I of NHDP. Implementation of initial set of projects has already commenced and the entire package is expected to be completed by 2012. Of the 6,500 km proposed under NHDP-V, about 5,700 km would be taken up in the GQ and the balance 800 km would be selected on the basis of predefined eligibility criteria.

Development of 1,000 km of Expressways (NHDP-VI)

With the growing importance of urban centers of India, particularly those located within a few hundred kilometers of each other, expressways would be both viable and beneficial. The Government has approved 1,000 km of expressways to be developed on a BOT basis, at an indicative cost of INR 166.80 billion (USD 3.3 billion).

Other Highway Projects of 700 km (NHDP-VII)

The development of ring roads, bypasses, grade separators and service roads are considered necessary for full utilization of highway capacity as well as for enhanced safety and efficiency. For this, development of such features at an indicative cost of INR 166.80 billion has been approved by the Government. Apart from the high density corridors, a substantial part of the National Highways network would also require development during the 11th Plan period. These sections are characterized by low density of traffic. The development of these categories of National Highways would be carried out primarily through budgetary resources.

Presently, the development and maintenance of National Highways is financed by following:

1. Government's general budgetary sources
2. Dedicated accruals under the Central Road Fund (by levy of cess on fuel)
3. Lending by international institutions like:
   - World Bank
   - ADB
   - JBIC
4. Private financing under PPP frameworks:
   - Build Operate and Transfer (Toll)/Design Build Finance Operate and Transfer (DBFOT)

Investment by private firm and return through levy and retention of user fee

- Build Operate and Transfer (Annuity) – BOT (Annuity) - Investment by private firm and

Return through semi-annual payments from NHAI as per bid.

- Special Purpose Vehicle – SPV (with equity participation by NHAI)
- Market Borrowings

Unlike other agreements for private infrastructure projects which neither define a time-frame for achieving financial close, nor specify the penal consequences for failure to do so, the Model Concession Agreement (MCA) stipulates a time limit of 180 days (extendable up to another 120 days on payment of a penalty), failing which the bid security shall be forfeited. By prevalent standards, this is a tight schedule, which is achievable only if all the parameters are well defined and the requisite preparatory work has been undertaken.

The MCA represents the comprehensive framework necessary for enabling financial close within the stipulated period. Adherence to such time schedules willensurea significant reduction in costs besides timely provision of the much needed infrastructure. This approach would also address the issue of infrastructure projects not achieving financial close for long periods.

The NHAI has introduced an additional condition for bidding road projects. For a venture of project cost less than Rs 30 billion, developers would be restricted from bidding if financial closure on their other projects is pending in three or more NHAI BOT projects as on bidding date. For a project cost equal to or more than Rs 30 billion, bidder will not be eligible if financial closure is pending in two projects. However, if a bidder convinces NHAI about surety of arrangement of funds for the project, it can bid for more projects.

In the Literature review part, we have tried to give an idea regarding estimation of Investment requirement in Roadways sector and the gap in this regard, if any. The then Prime Minister of India, Dr. Manmohan Singh has said that India needs to invest over USD 1 trillion in infrastructure by 2017, if the country wants to achieve 10% annual growth rate (Press Reports). In order to promote inclusive growth, systematic reforms are required for the institutions and processes. Pure private, PPP and pure Government may be three alternative ways of investment for funding in infrastructure sector. The literature review has tried to identify the gap in the area of quantum of investment that is required in highways sector. Once the quantum is determined, the significant determinant which attracts a pure private or PPP investor in this sector shall be identified.

Unlike other agreements for private infrastructure projects which neither define a time-frame for achieving financial close, nor specify the penal consequences for failure to do so, the MCA stipulates a time limit of 180 days (extendable up to another 120 days on payment of a penalty), failing which the bid security shall be forfeited. By prevalent standards, this is a tight schedule, which is achievable only if all the parameters are well defined and the requisite preparatory work has been undertaken.

The MCA represents the comprehensive framework necessary for enabling financial close within the stipulated period. Adherence

to such time schedules will usher in a significant reduction in costs besides timely provision of the much needed infrastructure.

Objectives of this thesis paper

1) To understand the dimension of 'Growth' in Roadways Sector
2) To estimate the amount of investment that would be required in the Highways sector and the share of private investment out of that
3) To determine the more significant factor in the growth of roadways sector, i.e, whether the amount of road constructed in a year or the amount of construction awarded in a year is more significant determinant for the investment in Roadways sector

Theoretical Framework

The 'Growth' of roadways can be measured from two dimensions in this entire article:

a) In terms of increase in length of Roadways/ Highways
b) In terms of increase in money value for allocation of fund/investment

The glimpse of the current status can be understood with the help of following table:

Table 1: NHDP status (as on May 31,2013)

	Unit	Phase							Total
		I	II	III	IV	V	VI	VII	
Total length	Km	7616	7142	12109	14799	5500	1000	700	49666
Completed till date	km	7346	6146	5491	247	1540	-	21	20791
Completion rate as % of total	%	96.5	86.1	45.3	1.7	23.7	-	3	41.7
Completion from April 12 - April 13	km	193	135	1848	247	630	-	8	2814
Under implementation	km	250	624	4933	4028	2540	-	20	12395
UI as a % of total	%	3.3	8.7	40.7	27.02	39.1	-	2.9	24.9
Balance length for award (BFA)	km	20	372	1685	10524	2420	1000	659	16680
BFA as a % of total	%	0.3	5.2	13.9	71.1	37.2	100	94	33.4
Cost incurred so far	Rs billion	411	596	658	34	212	-	8	1918

Note: For the purpose of our analysis, the entire length of the North South & East West (NSEW) corridor has been taken under Phase II and the entire length of Port Connectivity and Others national highways along with the Golden Quadrilateral has been taken under Phase I.

Source: NHAI, CRISIL Research

We now try to critically understand the amount of investment that will be required for the completion of the seven phases of NHDP.

Phase I: Largely complete

Phase I was approved by Cabinet Committee on Economic Affairs (CCEA) in December 2000. The phase includes:

- The 5,846 km Golden Quadrilateral (GQ) which connects the four major metros, viz Delhi, Mumbai, Chennai and Kolkata.
- A total of 380 km connecting the major ports - Haldia, Paradeep, Vishakhapatnam, Chennai and Ennore, Tuticorin, Kochi, New Mangalore, Marmugao, Jawarharlal Nehru Port Trust (JNPT) and Kandla - from the east coast to the west coast and to the GQ.
- Other national highway stretches of 1,390 km.

GQ, which constitutes about 77 per cent of the total length of Phase I, was completed in November 2012. As on May 31, 2013, about 97 per cent of Phase I was complete and about 3 per cent was under implementation. An amount of Rs 411 billion was spent on this phase till May 31, 2013.

Most projects in Phase I have been awarded on a cash contract basis. Over the next five years (2012-13 to 2016-17). Rs 16 billion to be invested for the completion of Phase I.

Phase II: Nearing completion

The CCEA approved Phase II, comprising the North South East West (NSEW) Corridor, in December 2003. This phase involves widening of North-South and East-West corridors. The total length of the NSEW Corridor is 7,142 km. As on May 31, 2013, about 86 per cent of the NSEW Corridor was complete. This entailed a cost of Rs 596 billion. During the year 2012-13, projects with a total length of 54 km were awarded under this phase. Further, about 9 per cent of the total length of the corridor was under implementation and about 5 per cent of the total length was yet to be awarded as of May 31, 2013.

The balance length of projects, out of the total length of 7,300 km in Phase II, to make an investment of Rs 49 billion over the next five years.

Phase III: Steady awarding

Phase III involves converting two-lane roads into four lanes. The criteria for identification of stretches under this phase are:

- High-density traffic corridors not included in Phases I and II
- Providing connectivity to state capitals with the NHDP (phases I and II)
- Connecting centres of tourism and places of economic importance

In 2011-12, projects with a total length of 1,871 km were awarded. However, award of project fell to 153 km in 2012-13. Out of the total length of 12,109 km under this phase, about 45 per cent was complete as on May 31, 2013. This involved a cost of Rs 658 billion. The government plans to implement most projects under this phase through the BOT-toll model. The less viable projects will be awarded under the BOT-annuity model.The least viable stretches will be awarded on cash contracts. The implementation of this phase is expected to require an investment of Rs 605 billion over the next five years.

Phase IV: Construction started

In this phase, national highways are planned to be improved to two-lane standards with paved shoulders. NHAI has identified a total of 14,799 km of road stretches under this phase and implementation has already started with about 2 per cent of the length executed for a total spend of Rs 34 billion till May 31, 2013.

Further, as on this date, about 27 per cent of the identified road length was under implementation and about 71 per cent was yet to be awarded.

In 2011-12, around 2,069 km of projects were awarded under this phase. However, during 2012-13, only about 644 km of projects were awarded. In 2013-14, projects with a total length of 217 km were awarded till June 30, 2013.

Under this phase, many of the projects are expected to be awarded on EPC basis, since the traffic volumes for these projects are lower, and thus, they are less attractive than Phase III and V projects. Therefore, if these projects are bid out on the BOT model, developer interest would be lower. The implementation of this phase is expected to require an investment of Rs 682 billion as per estimates for the next five years.

Phase V: Steady awarding

This phase involves six-laning of 6,500 km of selected stretches of existing four-lane national highways on design-build-finance-operate (DBFO) basis. This includes around 5,700 km of the GQ and other selected stretches at a total cost of Rs 412 billion (2006 prices).

As on May 31, 2013, about 24 per cent of Phase V was completed at a cost of Rs 212 billion. Further, as on this date, around 39 per cent of the total length under this phase was under implementation and around 37 per cent was left to be awarded.

Projects with a total length of 265 km were awarded in 2012-13. This was much lower than the 1,689 km length project awarding in 2011-12. In 2013-14, projects with a total length of 123 km were awarded till June 30, 2013.Over the next five years, implementation of this phase is estimated to require a total investment of Rs 448 billion.

Phase VI: No action on the ground

This phase includes the development of around 1,000 km of access-controlled four/six-lane divided carriageway expressways. Although this phase has been approved by the government, award has not been given.

Phase VII: Initial stages of implementation

This phase proposes construction of ring roads, flyovers and by-passes on selected stretches of the national highways at an estimated cost of Rs 167 billion. The government approved this phase in December 2007. While 700 km of stretches have been identified, about 3 per cent of the project length was implemented with an expenditure of Rs 8 billion as on May 31, 2013. As on this date, another 3 per cent of the project was under implementation and about 94 per cent was yet to be awarded.

Table 2: Investment Review of National Highways

REVIEW OF NH	2008-09	2009-10	2010-11	2011-12	2012-13
YR WISE INV (RS BILLION)	162	176	205	239	295
YR WISE AWARD OF LENGTH (KM)	1872	3214	5143	7283	1933
TOTAL LENGTH CONSTRUCTED/ UPGRADED (KM)	2458	2385	2620	2992	3350

Source: NHAI-FINAL.pdf, CRISIL Research

The investments in roads in the XI five year plan were Rs 3.6 trillion (115 per cent of the budget estimates) as against the estimated investment of Rs 3.1 trillion. Roads investment accounted for about 19 per cent of the overall infrastructure investments during the same period. Investments in roads is expected to increase to Rs 9.2 trillion in XII five year plan as against Rs 3.1 trillion (actual) in XI five year plan (increase of 2.9 times).

Between 2013-14 and 2017-18, it is expected that an average of 11.5 km per day of roads to be constructed / upgraded at an estimated cost of Rs 1,945 billion. National highway investments are expected to grow 2 times over the next five years from Rs 274 billion in 2012-13 to Rs 535 billion in 2017-18.

Table 3: Estimated Amt of Investment, Length Awarded and Constructed (2013-18)

	2013-14P	2014-15P	2015-16P	2016-17P	2017-18P
Year-wise estimated investment (Rs billion)	274	294	371	473	535
Year-wise break-up of total length awarded	2623	3434	4450	4776	5356
Total length constructed / upgraded	3206	3545	4215	4852	5000

Source: CRISIL Research (P stands for Projected)

In 2013-14, out of expected awarding of 2,623 km, nearly 50 per cent will be part of NHDP Phase IV, which mostly involves low traffic density stretches. Further, most of the projects will be awarded on EPC basis. Over the next five years, over 20,640 km of projects are expected to be awarded in national highways, amounting to an average of 11 km per day (including MORTH and NHAI).

Further, of the total length of 7,283 km awarded in 2011-12, projects with an aggregate length of 3,982 km arecurrently slowed down. Of the total project length stalled, about 56 per cent is primarily held up due to land acquisition orenvironmental clearance issues, while the rest are stuck due to the inability of companies to achieve financialclosure. Hence, project execution declined by around 4 per cent to 3,206 km during 2013-14.

There is increasing reliance on the private sector for developing and maintaining infrastructure. The private sector, however, needs funds to develop infrastructure projects that are capital-intensive and have a high gestation period. Typically, private investments in infrastructure projects are mainly in the form of debt raised by developers. As per Planning Commission, total investment in roadways sector during 12th 5-year plan (2012-17) will be INR 4900 billion, of which 40 per cent is expected to come from private sector.

Table 4:Showing Marginal increase in INR Billion and % in Government (MIG), Private (MIP) and Total Expenditure (MIT), assuming 2007-08 as 100 or Base (11th 5-yr Plan Pd)

MIG	MIP	MIT	%+/-G	%+/-P	%+/-T	
100.00	100.00	100.00				
118.4606	115.5401	117.4089	18.46	15.54	17.41	34.00
99.89212	110.5006	103.6518	-18.57	-5.04	-13.76	-23.61
132.9881	170.3969	147.1219	33.10	59.90	43.47	92.99
150.3821	166.2982	157.3468	17.39	-4.10	10.22	13.30
			50.38	66.30		116.68

Source: Author's own calculation and a derivative from the **original table given in the appendix**

Research Methodology and Hypotheses

The data used in this study are mostly secondary in nature. They have been collected from the official website of NHAI, Planning Commission, MOSRTH, Various RBI Reports, Transport Division of the Planning Commission, Budget section of the Ministry of Road Transport and Highways, Basic Road Statistics of GOI (2009-11), 'World Road Statistics 2011', published by International Road Federation, Geneva etc. Statistical Analysis is done with SPSS 21, MS Office Excel 2007 and other tools.

On the basis of theoretical framework, we formulate the following two hypotheses (Null and Alternative Statement):

Hypothesis 1: A) $H1_0$: Private Sector Expenditure and Government Sector Expenditure come from the same population

B) $H1_a$: Private Sector Expenditure and Government Sector Expenditure do not come from the same population

Hypothesis 2: A) $H2_0$: The dependent variable (Year-wise investment in Rs. Billion) does not depend on independent variables (Year-wise Award of Length, Year-wise Length Constructed)

H_0: $(b_1=b_2=0)$

B) $H2_a$: at least one b_i "0 (i.e, Dependent variable depends on at least one of the Independent variables)

Results, Workings and Findings

Table 5: Calculation of Chi-square statistic from table 4

E= (Row Total)x(Col Total)/ Total no of Observations		$\chi^2=\sum(O-E)^2/E$	
14.68139334	19.31938	0.972845	0.739295
-10.19385512	-13.4142	-6.88012	-5.22842
40.15366365	52.83857	1.240507	0.9427
5.740852675	7.554439	23.6541	17.97548
		final chi	**33.41638**

Source: Author's own calculation

For hypothesis 1, we have applied Chi Square Test of Homogeneity. As per the result, the value 33.42 is more than 7.81 (tabular) at 3 d.f, hence we reject NH (p=.05) and accept that Private Sector and Government Sector expenditure do not come from same population. Source of funding through Private investors have been justified by this hypothesis which is also reflected in the Government approach in the recent growth of Roadways Sector.

Table 6: Calculation on the basis of Table 2

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Constructed, Award[b]		Enter

a. Dependent Variable: Investment

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.982[a]	.965	.930	14.120	.965	27.604	2	2	.035

a. Predictors: (Constant), Constructed, Award

ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11006.466	2	5503.233	27.604	.035[b]
	Residual	398.734	2	199.367		
	Total	11405.200	4			

a. Dependent Variable: Investment

b. Predictors: (Constant), Constructed, Award

Coefficients[a]											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	-143.437	49.258		-2.912	.100	-355.375	68.501			
	Award	.000	.003	.008	.063	.955	-.013	.013	.092	.045	.008
	Constructed	.130	.018	.982	7.397	.018	.054	.205	.982	.982	.978
a. Dependent Variable: Investment											

Variable Processing Summary

		Variables	
		Dependent	
		Award	Constructed
Number of Positive Values		5	5
Number of Zeros		0	0
Number of Negative Values		0	0
Number of Missing Values	User-Missing	0	0
	System-Missing	0	0

Award

Linear

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.286	.082	-.224	2561.585

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1756448.100	1	1756448.100	.268	.641
Residual	19685153.900	3	6561717.967		
Total	21441602.000	4			

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Case Sequence	419.100	810.044	.286	.517	.641
(Constant)	2631.700	2686.613		.980	.400

Quadratic

Model Summary

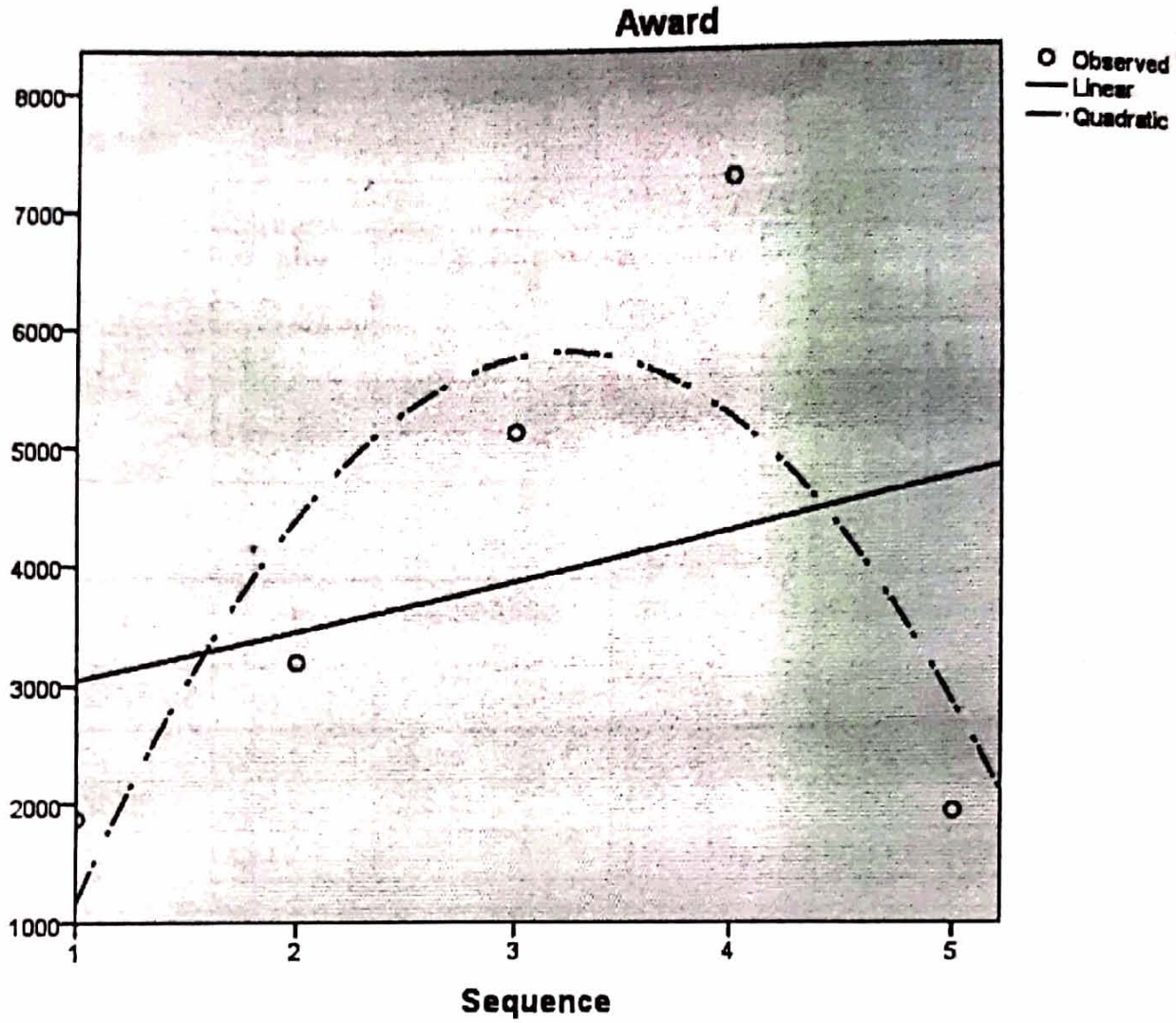
R	R Square	Adjusted R Square	Std. Error of the Estimate
.812	.660	.320	1909.228

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	14151300.171	2	7075650.086	1.941	.340
Residual	7290301.829	2	3645150.914		
Total	21441602.000	4			

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Case Sequence	6064.671	3120.538	4.142	1.943	.191
Case Sequence ** 2	-940.929	510.263	-3.930	-1.844	.206
(Constant)	-3954.800	4094.838		-.966	.436



Constructed

Linear

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.935	.875	.833	164.985

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	571688.100	1	571688.100	21.003	.020
Residual	81659.900	3	27219.967		
Total	653348.000	4			

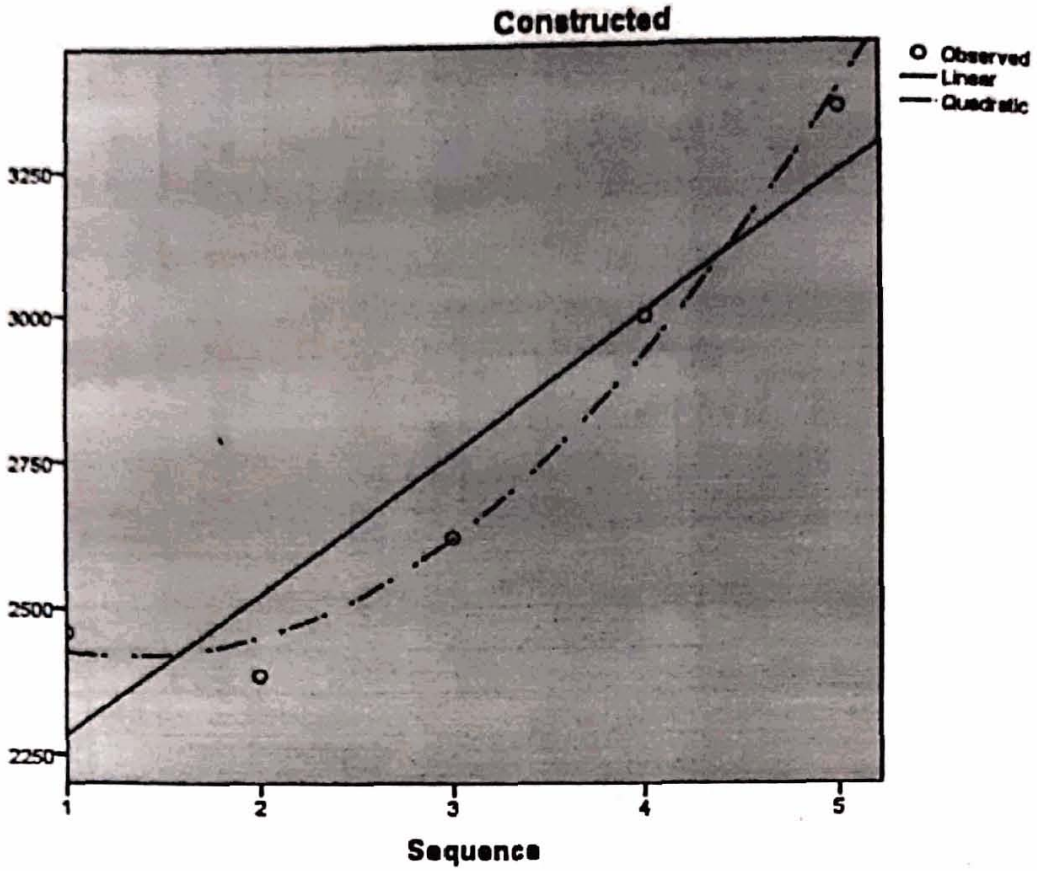
Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Case Sequence	239.100	52.173	.935	4.583	.020
(Constant)	2043.700	173.037		11.811	.001

Quadratic

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.992	.984	.968	72.021

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	642973.886	2	321486.943	61.979	.016
Residual	10374.114	2	5187.057		
Total	653348.000	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Case Sequence	-189.043	117.715	-.740	-1.606	.250
Case Sequence ** 2	71.357	19.248	1.707	3.707	.066
(Constant)	2543.200	154.468		16.464	.004



For hypothesis 2, we applied Multiple Regression Analysis, considering Investment (INV) as dependent, and Length Constructed and Length Awarded as independent variables. R square value of 96.8% describes major variability. To justify this variability, we applied F test for ANOVA. The result implies at least one of the independent variables is significant. The calculation table shows that out of the two, Length constructed is significant ($p<.05$) while others including the predictor are not. The finding rejects the null hypothesis and implies that rather than the Length-awarded (Year wise), Length-constructed (Year wise) is the more significant determinant of Investment in Roadways sector.

Conclusion

Financing is still one of the major constraints for the road sector. Most of the large developers or EPC contractors have kept the provision in their Balance Sheet to raise more debt for future. This restricts them to raise further debt for funding new road projects. This is one of the reasons for delay in financial closure. Domestic banks are exhausted to their maximum limits for lending in the infrastructure sector. The refinancing option through IIFCL has not become popular. Most of the large companies, playing a integrated role of developers as well as EPC contractors, are relatively few in numbers but have grabbed maximum number of projects in this sector.The present Government has discarded 41 unviable projects and about 8-10 problematic projects worth of INR 300 billion are to be sorted out. In 2013-14, the Government awarded 3625 km, while constructed 3950 km of roads. It has already constructed 3962 km out of 6353 km awarded till December for the year 2015-16. This trend

has acknowledged the "Road constructed" approach of this article and will surpass 6000 km mark, bypassing 5700 km of roads completed in 2012-13. Certain innovative approach for funding like Toll-Operate-Transfer (TOT) has been initiated by the present Government. Under this scheme, a private firm can take over a stretch already built up under NHAI for an upfront fee. 104 highway projects have been identified under this approach, where future revenues can be securitized.

Appendix

Table I: Ministry of Road Transport and Highways Central Roads sector outlay and expenditure –Gross Budgetary Support (GBS) [RsCrore]

S No	Schemes/Programmes	Eleventh plan (2007-		Annual Plan 2007-08		Annual Plan 2008-09		Annual Plan 2009-10		Annual Plan 2010-11		Annual Plan 2011-12
		Outlay	Budget Estimate	Expenditure	Budget Estimate	Expenditure	Budget Estimate	Expenditure	Budget Estimate	Expenditure	Budget Estimate	Expenditure (Prov.)
1	2	3	4	6	7	9	10	12	13	15	16	18
	Total (BS)	71,830.00	12,440.00	12,340.48	13,270.00	13,349.39	15,198.00	13,690.71	17,700.00	17,800.30	19,600.00	17,426.48
	IEBR	34,829.00	2,090.00	305.18	4,100.00	1,630.74	5,000.00	1,273.26	7,455.00	2,100.00	17,500.00	12,500.00
	Total GBS + IEBR	106,659.00	14,530.00	12,645.66	17,370.00	14,980.13	20,198.00	14,963.97	25,155.00	19,900.30	37,100.00	29,926.48
	Private Sector Investment	86,792.00	7,325.00	7,057.38	13,938.00	8,179.75	16,071.66	8,944.61	21,256.00	15,354.37	23,301.68	25,749.38
	Pvt Sec (non-NHDP)			60.00		43.68		142.33 -		129.49		0.00
	Total Pvt Sect		7,325.00	7,117.38	13,938.00	8,223.43	16,071.66	9,086.94	21,256.00	15,483.86	23,301.68	25,749.38
	Total Central Roads Sector		21,855.00	19,763.04	31,308.00	23,203.56	36,269.66	24,050.91	46,411.00	35,384.16	60,401.68	55,675.86

Source: Planning Commission

Table II: Expenditure (in INRBillion): Central Road Sector-Government & Private sector with percentage

A.PLAN	GSEXP	PSEXP	TOTEXP	G%	P%
2007-08	126.4566	71.1738	197.6304	63.986411	36.013589
2008-09	149.8013	82.2343	232.0356	64.5596193	35.4403807
2009-10	149.6397	90.8694	240.5091	62.21789529	37.78210471
2010-11	199.0030	154.8386	353.8416	56.24070205	43.75929795
2011-12	299.2648	257.4938	556.7586	53.75126671	46.24873329

Source: Author's own calculation

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