Infrastructure

Decoding the HAM – Model, Bidding, O&M, FC, and more

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Hybrid Annuity Model – the new preferred model of award for NHAI

NHAI ended FY18 with a bang – awarding ~4,700km (~Rs 1trillion) of projects in the last three months – taking the full year award number to 7,400km (+70% yoy). In both FY17/18, the share of HAM projects increased significantly – they constituted 54% of the total length awarded in FY17 (62% of project cost) and 46% in FY18 (63% of project cost). In FY19 and beyond, we expect over 50% of the total projects to be awarded by NHAI to be HAM projects – making it the preferred mode of award.

HAM projects – more like deferred EPC than BOT

NHAI has taken great care to ensure that HAM is viewed as a deferred EPC model, rather than a modified BOT model. With 40% contribution coming from NHAI, project execution is significantly de-risked. Also, since the annuity amount is linked via fixed percentages to project cost, the uncertainty related to revenues (traffic growth and tariff hike) has also been eliminated. Lastly, shorter duration of projects (15 years vs. 20-25 years for a BOT project) also ensures the developers are able to unlock and rotate capital sooner.

Bidding in HAM projects – a tight rope walk between maximizing chances of winning and IRR

The financial bid for a HAM project comprises of two parameters – 'Bid Project Cost (BPC)' and 'First year O&M cost (O&M)'. The variable that the developers generally use to generate superior returns is the BPC – as the grant component and two revenue streams are linked to the BPC. Hence, the winning bids in all the HAM projects awarded have been 'above' the NHAI cost. **Our calculation shows that a 5% higher project-cost bid can lead to almost 4% incremental IRR from the project**.

HAM bidding is actually a tightrope walk between balancing the right mix of BPC and O&M cost – so as to maximize the project IRR – but maintain the competitiveness of the bid. Analyzing the HAM bidding data, we find that the developers have, in general, been quoting higher EPC cost, and significantly lower O&M cost – helping them outbid other players on lower NPV, while maintaining their desired IRRs. We also find **high level of discipline in bidding activity – with the difference between L1 and L2, in most projects being in the 2-8% range.**

High orderbook concentration of HAM projects

On the back of recent HAM project wins, orderbooks of some of the developers have acquired high concentration of HAM projects – many of them awaiting financial closure (FC). For players such as **IRB, Ashoka, PNC and Dilip, more than 35% of their orderbooks comprise of HAM projects awaiting FC**. We remain cautious about companies going aggressive over this relatively 'new' model – especially with concerns related to financial closure resurfacing, over the last few months.

Financial closures – a grave concern, amplified by the problems in the financial sector

Our analysis of 8 listed companies reveals that **30 HAM projects, with an estimated capital expenditure of Rs 400bn, are yet to achieve FC.** Most of these projects were won by the developers in the Feb-Apr 2018 period. With 11 banks under PCA (Prompt Corrective Action), three more likely to slip into PCA, and SBI *(largest lender to the infrastructure sector)* 'reluctant' to lend to HAM projects – we see, as much as **85% of the institutional capacity, that lends to the sector, unwilling/incapable of lending for HAM projects.** Hence, it does not seem completely improbable, that many of the recently won HAM projects might not be able to achieve FC, and might have to be cancelled.

Anticipating this, many developers have started **approaching NBFCs, to fund their HAM projects**. This step, while a temporary solution, will adversely impact the IRR of these HAM projects – as the lending rate of NBFCs will be significantly higher than the banking institutions. **Our analysis reveals that the IRR of a HAM project falls by 150bps, if the financing cost increases by 100bps.** At the same time, many financing institutions are willing to finance only 35% of the BPC – translating into higher equity investment from the developers – further translating into lower equity IRR.

Pecking order – prefer players with lower/zero exposure to HAM projects

We view HAM as a great model for the industry, adequately balancing the risk-reward for the developers, along with helping NHAI spread its expenditure over a longer tenure. However, in the current state of the banking sector, HAM projects create incremental risk for the developers' balance sheets. Hence, **we prefer players with zero exposure to HAM projects – NCC, Ahluwalia and JKumar. Amongst players with HAM exposure, we prefer those with a lower exposure to HAM projects awaiting FC (KNR), or companies with a relatively strong balance sheet (Ashoka, PNC, Sadbhav).**

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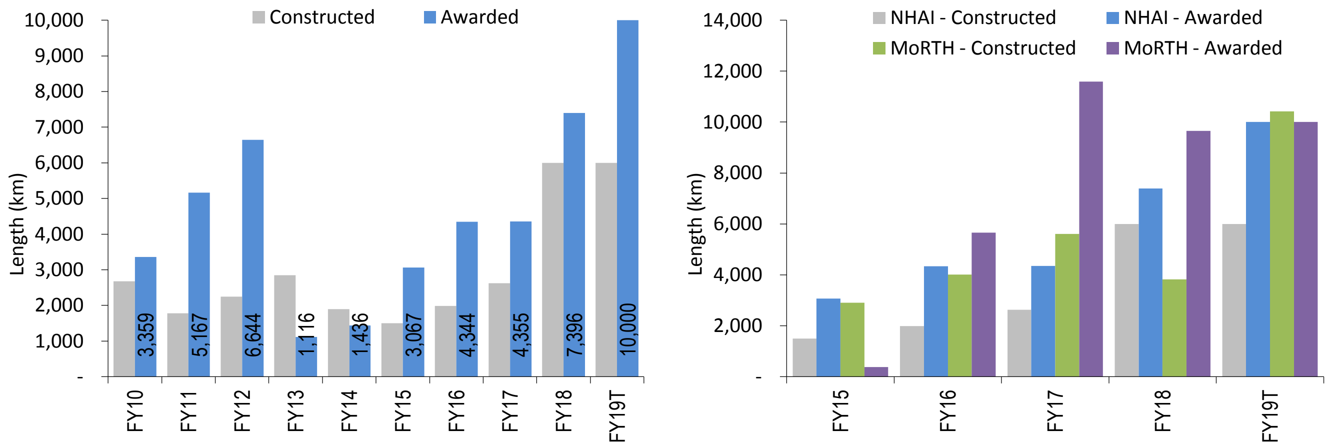
A strong end to FY18 by NHAI

In the first ten months of FY18, NHAI order award activity had been highly disappointing, with the body awarding only ~2,700km of projects. The order award activity was impacted by:

1) **Recurring changes in NHAI's management:** NHAI recently got its fifth chairman in last three years when Mr. Y.S. Malik replaced Mr. Deepak Kumar (who had earlier replaced Mr. Malik himself). Mr. Malik, had earlier replaced Mr. Raghav Chandra in 2016 – who in turn had come as a replacement for Mr. R.P. Singh. These frequent changes have led to an overall slowdown in the order award process.
2) **Land acquisition problems:** NHAI's resolution is NOT to award any project unless 90% of the land is acquired. While this delays the order award process by few months, it has an overall positive impact – because projects, once awarded, will not be stuck due to land acquisition problems *(as was the case earlier)*.

However, in the last three months of FY18, NHAI came out with all guns firing – awarding ~4,700km (~Rs 1trillion) of projects – taking the full year award number to 7,400km (+70% yoy). Along with MoRTH, the total road awards for FY18 stood at 17,055kms – 7% higher than FY17. With the resolution of land acquisition problems, a new chairman, and the new pipeline (Bharatmala Paryojna) announced in late 2017 – we expect a robust order award activity in FY19 and beyond.

NHAI + MoRTH delivered a strong performance in FY19, despite initial hiccups



Source: NHAI, PhillipCapital India Research

HAM order dominated NHAI orders in FY17/18

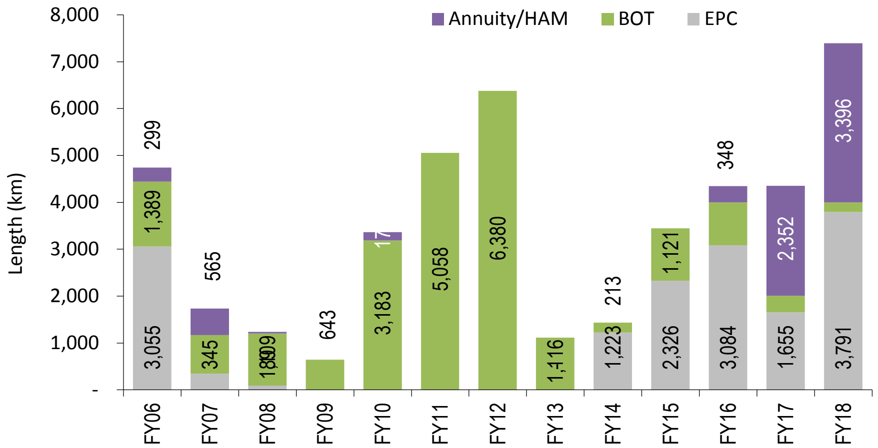
NHAI's order pipeline over the last two years has been boosted by the new model of construction – Hybrid Annuity (HAM). As explained in our earlier report **here**, HAM is more like 'deferred EPC', where the NHAI pays 40% of the project cost upfront, and the remaining 60% over the next 15 years. With no traffic/tariff risk, the model has received tremendous response from the developers. HAM projects constituted 54% of the total length awarded by NHAI in FY17 (62% in terms of project cost awarded) and 46% in FY18 (63% in terms of project cost awarded).

NHAI has taken great care to ensure that HAM is viewed as a deferred EPC model, rather than a modified BOT model.

- 40% contribution coming from NHAI, project execution is significantly de-risked.
- The amount of annuity is linked via fixed percentages to the project cost, the uncertainty related to revenues (traffic/tariff) has also been eliminated.
- Lastly, shorter duration of projects (15 years vs. 20-25 years for a BOT project) ensures that developers are able to unlock capital sooner.

Over the last four months (esp. Feb-Apr 2018), NHAI awarded a large number of HAM projects – which were grabbed by the EPC companies. As much as 3,400km of HAM projects (of the total 7,400km) were awarded in FY18, aggregating to Rs 765bn of project cost. Over 75% of these were awarded in the last few months of FY18.

Increasing share of HAM projects in awards over the last three years



Source: NHAI, PhillipCapital India Research

HAM projects – more like deferred EPC than BOT

A typical HAM model has three streams of cash inflows and three streams of cash outflows.

HAM Model – construction and tariff period dynamics

	Construction period	Tariff period	
		Revenue streams	
	40% contribution from NHAI Rs 400mn	Fixed semi annuity payments for remaining 60% of project cost	Cumulative Rs 600mn (adjusted for inflation)
		Semi-annual interest payment for unfunded project cost	@ Bank rate + 300bps, on the declining O/S balance
Bid project cost Rs 1,000mn	Debt availed Rs 400mn	O&M reimbursement	As quoted by the developer, indexed to inflation
		Expense streams	
	Equity from developer Rs 200mn	Actual O&M cost incurred	
		Interest payment on the debt availed	As per lenders' terms
		Principal repayment of the debt availed	As per lenders' terms

Source: PhillipCapital India Research

Dynamics of a HAM project

Bidding stage

The financial bid for a HAM project comprises of two parameters – 'Bid Project Cost (BPC)' and 'First year O&M cost'. The NHAI 'model' then calculates the NPV of these two numbers automatically, and their summation becomes the 'bid parameter' for the developer – on which the developers compete.

HAM bidding model – input and output parameters

Parameter (Rs mn)	Quoted Value	Parameter (Rs mn)	Determined Value
		NPV of bid project cost	860.95
Bid project cost	1,000	NPV of O&M	162.49
First year O&M quote (Annual)	20	Bid NPV	**1023.44**

Source: NHAI, PhillipCapital India Research

After the project is awarded, the bid NPV (combination of BPC and O&M) becomes irrelevant. The BPC and O&M variables determine the amount the developer gets from the NHAI at various stages of the lifecycle of the project.

Bidding strategy

The maximum IRR that a developer can make in a HAM project, if it quotes its actual EPC and O&M cost, is 11.57%; this is if we assume that the developer has a borrowing cost 100bps lower than what NHAI offers on the deferred annuity payments (exhibit 1, page 5).

This then, necessitates developers to increase the EPC and/or O&M cost – to improve their IRRs. But such moves might lead to their bid becoming uncompetitive, and other players winning the project. Hence, the HAM becomes a tightrope walk in balancing the right mix of BPC and O&M cost; the aim is to maximize the project IRR while maintaining the bid's competitiveness.

BPC – bid project cost

This is the most important variable in the bid – as the grant component and two revenue streams (annuity and the interest on outstanding annuity) are linked to it. BPC can impact the IRR of the project significantly. This is also where most developers are being aggressive, and we have seen the winning bids on HAM being, on an average, 15-20% higher than the NHAI BPC cost.

Our sensitivity analysis (exhibit 1 and 2) shows that keeping all other variables intact, the IRRs from HAM project can improve by 370bps (to 15.2% from 11.5%) by just increasing the BPC by 5%.

O&M cost

O&M cost has relatively lower impact on the project/equity IRR as compared to the BPC. Hence, the developers have used O&M to reduce their bid NPV (so that they can win the project easily) without having to compromise much on the IRR (which is dependent disproportionately on the quoted BPC cost). We have seen developers quoting O&M costs that are much lower than 0.5% of the BPC, whereas the standard number generally is 2%.

Impact of change in O&M bid – on bid price and equity IRR (for above example)

O&M cost (Rs mn)	12	20	28
Bid NPV	958	**1,023**	1,088
% Change	-6%	**0%**	6%
IRR	5.5%	**11.6%**	16.7%
% Change (bps)	(604)	-	508

Source: PhillipCapital India Research

With help from various developers and consultants, we have made an "exclusive simplified representative HAM model", which can be used to calculate the expected IRR of the project, with various bid parameters serving as inputs. The model also helps in calculating the various sensitivities that we have discussed in the report.

Exhibit 1 – HAM Model – theoretical case – bid cost same as project cost (O&M expense same as quoted)

Project period (year)		1	2	3	4	5	6	7	....	16	17	18
Tariff period (year)					1	2	3	4	....	13	14	15
Construction cost		20%	45%	35%		**Actual Cost (TPC)**		1,000				
Expenditure	1,000	200	450	350		**Bid Project C (BPC)**		1.000				
Grant	400	80	180	140								
Equity	120	24	54	42								
Debt	480	96	216	168								
Bid project cost	1,000											
Annuity payment schedule	60%				**2.6%**	**2.7%**	**2.9%**	**3.1%**	....	**5.1%**	**5.5%**	**5.7%**
Escalation	60	6%										
Annuity payments	600	636			27	29	31	33	....	54	58	60
Closing balance of annuities				636	609	580	549	517	....	119	60	(0)
Interest earned	**10.0%**				62	59	56	53	....	15	9	3
O&M Payment	**5.0%**				20	21	22	23	....	36	38	40
Total Cash Inflow					**109**	**109**	**109**	**109**	....	**105**	**105**	**103**
O&M Expense	**5.0%**				20	21	22	23	....	36	38	40
Interest payments	**9.0%**				42	38	35	32	....	2	0	0
Debt repayment					37	37	37	37	....	37	-	-
Depreciation					40	40	40	40	....	40	40	40
PBT					8	10	12	14	....	27	27	23
Tax	**20%**				2	2	2	3	....	5	5	5
Total Cash Outflow					**100**	**98**	**96**	**95**	**....**	**80**	**43**	**44**
FCFE		**(24)**	**(54)**	**(42)**	**9**	**11**	**13**	**15**	....	**25**	**62**	**59**
IRR	**11.6%**											

Exhibit 2 – HAM Model – actual bidding by developers – bid cost higher than project cost (O&M expense same as quoted)

Project period (year)		1	2	3	4	5	6	7	....	16	17	18
Tariff period (year)					1	2	3	4	....	13	14	15
Construction cost		20%	45%	35%		**Actual Cost (TPC)**		1,000				
Expenditure	1,000	200	450	350		**Bid Project C (BPC)**		1.050				
Grant	420	84	189	147								
Equity	116	23	52	41								
Debt	464	93	209	162								
Bid project cost	1,050											
Annuity payment schedule	60%				**2.6%**	**2.7%**	**2.9%**	**3.1%**	....	**5.1%**	**5.5%**	**5.7%**
Escalation	63	6%										
Annuity payments	630	668			29	30	32	34	....	57	61	63
Closing balance of annuities				668	639	609	577	542	....	125	63	(0)
Interest earned	**10.0%**				65	62	59	56	....	15	9	3
O&M Payment	**5.0%**				20	21	22	23	....	36	38	40
Total Cash Inflow					**114**	**114**	**114**	**113**	....	**108**	**108**	**106**
O&M Expense	**5.0%**				20	21	22	23	....	36	38	40
Interest payments	**9.0%**				40	37	34	31	....	2	0	0
Debt repayment					36	36	36	36	....	36	-	-
Depreciation					39	39	39	39	....	39	39	39
PBT					15	17	19	21	....	32	32	28
Tax	**20%**				3	3	4	4	....	6	6	6
Total Cash Outflow					**99**	**97**	**95**	**94**	**....**	**80**	**44**	**45**
FCFE		**(23)**	**(52)**	**(41)**	**15**	**17**	**18**	**20**	....	**28**	**64**	**61**
IRR	**15.2%**											

Source: PhillipCapital India Research

The two independent variables – BPC and O&M cost – together and individually – impact the dependent variables – bid NPV and Equity IRR. HAM bidding is essentially a balancing act between the two independent variables, so that the two dependent variables are impacted in a way that the developer makes the desired IRR, while not rendering his bid uncompetitive.

Using our representative HAM model and the NHAI bidding model, we have calculated the sensitivities of bid-price and project-IRR to the two variables.

HAM bidding model – Bid price sensitivity to BPC and O&M cost

Bid Price		Change in BPC Cost				
		-10.0%	-5.0%	0.0%	5.0%	10.0%
Change in O&M Cost	-40.0%	-14.8%	-10.6%	-6.4%	-2.1%	2.1%
	-20.0%	-11.6%	-7.4%	-3.2%	1.0%	5.2%
	0.0%	-8.4%	-4.2%	0.0%	4.3%	8.5%
	20.0%	-5.2%	-1.0%	3.2%	7.4%	11.6%
	40.0%	-2.1%	2.1%	6.3%	10.5%	14.8%

HAM bidding model – equity IRR sensitivity to BPC and O&M cost

Equity IRR		Change in BPC Cost				
	11.6%	-10.0%	-5.0%	0.0%	5.0%	10.0%
Change in O&M Cost	-40.0%	0.0%	1.7%	5.5%	9.5%	13.5%
	-20.0%	1.5%	5.0%	8.7%	12.5%	16.3%
	0.0%	4.6%	8.0%	11.6%	15.2%	19.0%
	20.0%	7.4%	10.8%	14.2%	17.8%	21.4%
	40.0%	10.0%	13.3%	16.7%	20.1%	23.8%

Source: PhillipCapital India Research

As we can see, the BPC and O&M costs have disproportionate impact on the bid price and IRRs.

- A 5% increase in BPC increases the bid price by 4.3% and the equity IRR of the project by 360bps.
- A 20% decrease in O&M cost reduces the bid price by 3.2%, but also lowers the equity IRR by 290bps.

The developers have, in general, been quoting higher EPC cost, and significantly lower O&M cost – helping them outbid other players on lower bid price, while maintaining their desired IRRs.

Early and late completion

The HAM model doesn't reward or penalize a developer much in case it completes the project before or after the scheduled CoD.

- Early completion bonus kicks in if the project is completed more than 30 days in advance. Thereafter, the bonus is awarded at the rate of 0.3% of BPC (0.5% of 60% of BPC), for each month – essentially translating into less than 1% of TPC for completing the project four months in advance.
- Late-completion penalty is levied if the project is delayed for more than 90 days (no penalty for delay less than 90 days). Thereafter, a penalty of 1bps (Rs 100 penalty for a Rs 1mn BPC) is levied for each day that the project is delayed.
- The annuities to be paid are linked to scheduled CoD and NOT the actual CoD. Therefore, the developer will receive the annuities at same predetermined time, irrespective of when it completes execution on the project.

For a project with BPC of Rs 10bn:

Early completion bonus, for completing 120 days in advance = Rs 90mn

Late completion penalty, for completing 120 days late = Rs 30mn

Essentially, the dynamics of the HAM projects translate into much higher effort during the bidding stage than at the execution stage. With rewards/penalties being limited for early/late completion, developers are incentivized to get the bidding right. Execution delays do not lead to significant penalties, but will continue to impact the overall IRR of the project considerably.

Bidding trends in O&M costs

Developers quoting lower O&M costs have raised serious concerns – not only with investors, but also bankers looking to finance the HAM projects. A look at past trends of bidding for O&M costs for various HAM projects indicates that the O&M costs were much closer to reality in the initial rounds of HAM awards (FY16/17); however, in the most recent round (Feb-Apr 2018), they have become highly aggressive.

However, these lower O&M costs are expected to be well compensated by the higher BPC that the developers have quoted. As discussed in earlier sections, the lower O&M costs help bidders arrive at a lower NPV, making their bid more competitive – and the higher BPC costs ensures that they generate healthy IRR form the project.

*In the initial rounds of HAM awards **(FY16/17, blue cells),** the O&M costs were much closer to reality (2% of BPC)*

*However, in the most recent round **(Feb-Apr 2018, red cells),** they have become highly aggressive*

The irrelevance of the O&M cost has been exemplified by Dilip Buildcon, which quoted the exact same O&M costs for all its HAM bids, irrespective of the length, size and complexity of the projects

O&M cost as % of BPC have been lower in recent rounds of bidding

	Project (Rs mn)	BPC	O&M	O&M as % of BPC
Sadbhav	Rampur - Kathgodam - I	7,380	76	1.0%
	Rampur - Kathgodam - II	6,570	90	1.4%
	Bhavnagar – Talaja	8,190	105	1.3%
	Una – Kodinar	6,230	85	1.4%
	BRT Tiger Reserve - Bangalore	10,080	315	3.1%
	Waranga Mahagaon	10,710	67	0.6%
	Udaipur Bypass	8,910	30	0.3%
	Jodhpur Ring Road	11,610	35	0.3%
	Vizag Port Road	5,490	21	0.4%
	Bhimasar Jn - Airport Jn	11,520	45	0.4%
	Tumlur Shivamogga	10,080	36	0.4%
	Vadodara Kim expressway	14,040	63	0.4%
Ashoka	Khairatunda - Barwa Adda	8,601	53	0.6%
	Tumkur Shaivamogga - 1	9,170	63	0.7%
	Tumkur Shaivamogga - 2	12,185	72	0.6%
	Belgaum Khanapur	8,562	30	0.4%
	Vadodara Kim expressway	16,870	26	0.2%
KNR	Trichy Kallagam	10,206	31	0.3%
	Meensurutti Chidambram	4,820	31	0.6%
	Chittor Mallavaram	17,301	21	0.1%
	Ramsanpalle Mangloor	12,340	30	0.2%
PNC	Dausa Lalsot	8,810	41	0.5%
	Chitradurga Devnagree	14,340	90	0.6%
	Jhansi Khajuraho - I	14,100	55	0.4%
	Jhansi Khajuraho - II	13,100	90	0.7%
	Chakeri Allahabad	21,590	88	0.4%
	Aligarh Kanpur	11,970	72	0.6%
	Challakere Hariyur	11,570	45	0.4%
IRB	Poondiankuppam - Sattanathapuram	21,690	11	0.0%
	Puducherry - Poondiyankuppam	12,960	21	0.2%
	Vadodara Kim Expressway	20,430	27	0.1%
Dilip	Chandikhole Bhadrak	15,220	30	0.2%
	Gorhar Khairatunda	9,170	30	0.3%
	Nidagatta Mysore	22,830	30	0.1%
	Mangloor Tel/Maha border	9,360	30	0.3%
	Bangalore Nidagatta	21,900	30	0.1%
	Byrapura Challakere	8,417	30	0.4%
	Anandapuram Anakapalli	20,130	30	0.1%
	Sangli Solapur (Pckg - 4)	11,410	30	0.3%
	Sangli Solapur (Pckg - 2)	10,294	30	0.3%
	Sangli Solapur (Pckg - 1)	11,024	30	0.3%
	Churhat Bypass	10,040	30	0.3%
MEP	Nagpur citypackage - 1	5,310	63	1.2%
	Nagpur city package - 2	6,390	68	1.1%
	Talaja Mahuva	6,430	90	1.4%
	Mahuva to Kagavadar	6,047	85	1.4%
	Arawali Kante	5,930	57	1.0%
	Kamle Wakad	8,263	116	1.4%
	Ausa-Chakur	8,486	27	0.3%
	Chakur Loha	10,011	27	0.3%
	Loha Warang	10,731	30	0.3%
	Vadpe Thane	11,829	45	0.4%

Source: Companies, PhillipCapital India Research

Competitive intensity in bidding

A look at bidding activity in the HAM projects reveals a high level of discipline from the players. The difference between L1 and L2, in most projects, has been in the range of 2-8%, except for some outliers (one/two projects for Sadbhav, Dilip Buildcon, IRB and MEP).

Sample space of 35 projects reveals only 6% difference between L1/L2 and 11% between L1/L3

Project	Winning Bids	NHAI Cost		L2			L3		
	Rs mn	Rs mn	% diff	Name	Bid	% diff	Name	Bid	% diff
Total 35 Projects	**3,67,733**	**NA**	**NA**	**NA**	**3,91,243**	**-6%**	**NA**	**4,11,868**	**-11%**

Source: Companies, PhillipCapital India Research

Bidding in HAM projects has largely been sensible, with little variations between L1/L2/L3

Project	Winning Bid	NHAI Cost		L2			L3		
	Rs mn	Rs mn	% diff	Name	Bid	% diff	Name	Bid	% diff
Sadbhav									
Project # 3	xxx	xxx	13%	ABCD	xxx	-1%	ABCD	xxx	-5%
Project # 1	xxx	xxx	12%	ABCD	xxx	-3%	ABCD	xxx	-13%
Project # 5	xxx	xxx	44%	ABCD	xxx	-17%	ABCD	xxx	-19%
Project # 7	xxx	xxx	32%	ABCD	xxx	-2%	ABCD	xxx	-7%
Project # 2	xxx	xxx	17%	ABCD	xxx	-9%	ABCD	xxx	-15%
Project # 6	xxx	xxx	2%	ABCD	xxx	-2%	ABCD	xxx	-4%
Project # 4	xxx	xxx	40%	ABCD	xxx	0%	ABCD	xxx	-7%
Ashoka									
Project # 3	xxx	xxx	NA	ABCD	xxx	-4%	ABCD	xxx	-22%
Project # 1	xxx	xxx	6%	ABCD	xxx	0%	ABCD	xxx	-6%
Project # 5	xxx	xxx	7%	ABCD	xxx	-3%	ABCD	xxx	-5%
Project # 2	xxx	xxx	NA	ABCD	xxx	-3%	ABCD	xxx	-6%
Project # 4	xxx	xxx	46%	ABCD	xxx	-4%	ABCD	xxx	-5%
PNC									
Project # 3	xxx	xxx	34%	ABCD	xxx	0%	ABCD	xxx	0%
Project # 1	xxx	xxx	31%	ABCD	xxx	-2%	ABCD	xxx	1%
Project # 2	xxx	xxx	30%	ABCD	xxx	-2%	ABCD	xxx	-1%
IRB*									
Project # 1	xxx	xxx	36%	ABCD	xxx	-17%	ABCD	xxx	-20%
Dilip									
Project # 3	xxx	xxx	13%	ABCD	xxx	-5%	ABCD	xxx	-5%
Project # 1	xxx	xxx	20%	ABCD	xxx	-14%	ABCD	xxx	-21%
Project # 5	xxx	xxx	-7%	ABCD	xxx	-1%	ABCD	xxx	-12%
Project # 2	xxx	xxx	-2%	ABCD	xxx	-7%	ABCD	xxx	-9%
Project # 4	xxx	xxx	21%	ABCD	xxx	-2%	ABCD	xxx	-7%
Project # 8	xxx	xxx	-9%	ABCD	xxx	-3%	ABCD	xxx	-6%
Project # 6	xxx	xxx	-1%	ABCD	xxx	-4%	ABCD	xxx	-10%
Project # 7	xxx	xxx	1%	ABCD	xxx	0%	ABCD	xxx	-1%
Project # 9	xxx	xxx	5%	ABCD	xxx	-6%	ABCD	xxx	-11%
Project # 10	xxx	xxx	14%	ABCD	xxx	-4%	ABCD	xxx	-7%
MEP									
Project # 3	xxx	xxx	NA	ABCD	xxx	-4%	ABCD	xxx	-11%
Project # 1	xxx	xxx	NA	ABCD	xxx	1%	ABCD	xxx	-14%
Project # 7	xxx	xxx	NA	ABCD	xxx	-1%	ABCD	xxx	-2%
Project # 2	xxx	xxx	NA	ABCD	xxx	-2%	ABCD	xxx	-18%
Project # 4	xxx	xxx	NA	ABCD	xxx	-2%	ABCD	xxx	-30%
Project # 8	xxx	xxx	NA	ABCD	xxx	-6%	ABCD	xxx	-10%
Project # 6	xxx	xxx	NA	ABCD	xxx	-2%	ABCD	xxx	-5%
Project # 5	xxx	xxx	NA	ABCD	xxx	-10%	ABCD	xxx	-11%
Project # 9	xxx	xxx	NA	ABCD	xxx	-31%	ABCD	xxx	-34%

Source: Companies, PhillipCapital India Research (**Comparison of BPCs*)

(We have masked the project/companies names/bids as these are sensitive competitive information)

Burgeoning orderbooks with unfinanced HAMs

On the back of recent HAM project wins, orderbooks of some of the developers have acquired a high concentration of HAM projects. For players such as IRB Infra, Ashoka Buildcon, PNC Infra and Dilip Buidlcon, more than 35% of their orderbooks (incl. L1) comprise of HAM projects that are awaiting financial closure.

Leading developers in the HAM segment and their project wins

Company	# of HAMs	Length (km)	Bid Project Cost (Rs mn)
Dilip Buildcon	17	974	2,18,296
Sadbhav Infra	12	672	1,10,810
PNC Infra	7	564	92,750
Ashoka Buildcon	7	NA	79,668
MEP Infra	10	504	79,426
Welspun Ent	6	240	71,810
KNR Construction	5	179	56,337
IRB Infra	3	119	55,080
Total	**67**	**3,252**	**7,64,178**

Source: Companies, PhillipCapital India Research

High share of HAM projects in the orderbooks of few developers

Company (Rs mn)	Tot OB	HAM Projects	OB Share	HAMs Awaiting FC	OB Share
Sadbhav Infra	1,32,493	99,729	75%	41,130	31%
Ashoka Buildcon	1,19,120	71,701	60%	55,388	46%
KNR Construction	74,686	50,703	68%	24,010	32%
PNC Infra	1,06,740	83,475	78%	45,130	42%
IRB Infra	1,50,800	49,572	33%	55,080	37%
Dilip Buildcon	2,38,881	1,96,467	82%	1,12,078	47%
MEP Infra	NA	71,484	NA	41,057	NA
Welspun Ent	76,000	64,629	85%	20,045	26%
Total	**8,98,720**	**6,16,276**	**69%**	**3,52,861**	**39%**

Source: Companies, PhillipCapital India Research *(OB = Orderbook)*

We see the high share of 'HAM projects awaiting FC' exposing the financials and the stock prices of various developers to multiple risks:

1) Most of these projects were awarded in last months of FY18 – and will probably achieve financial closure only by mid-FY19. Hence, they will NOT contribute significantly to the FY19 topline. Therefore, the current strong orderbooks do not represent the correct picture at least from FY19 execution point.
2) Given the current state of the financial sector (discussed in next section), it does not seem completely improbable that many of the recently won HAM projects are not be able to achieve FC, and might have to be cancelled.
3) The magnitude of these HAM projects is so high that they will strain the balance sheets of the developers even more, as they will need to take on higher debt to fund the equity requirement of these projects.

The equity requirement for HAM projects could burden the balance sheets

Company (Rs mn)	Equity required	Current Debt*	As % of debt
Sadbhav Infra	13,306	13,300	100%
Ashoka Buildcon	7,303	1,251	584%
KNR Construction	6,760	2,256	300%
PNC Infra	9,756	1,701	574%
IRB Infra	6,610	30,252	22%
Dilip Buildcon	17,975	37,269	48%
MEP infra	5,381	NA	NA
Welspun Ent	8,656	NA	NA
Total	**75,748**	**86,029**	**72%**

Source: Companies, PhillipCapital India Research *(*All Debt figures at standalone/holdco level)*

While NHAI has de-risked the HAM model to a large extent, we remain cautious about companies going aggressive over this relatively 'new' model of road development – and would keep a keen eye on the FC / execution timelines.

Financial closure remains a BIG concern

Our analysis of 8 companies reveals that 30 HAM projects, with an estimated capital expenditure of Rs 400bn, are yet to achieve FC. Most of these projects were won by the respective developers in the Feb-Apr 2018 period – giving them a window of six months (till Oct-2018) to achieve financial closure. With 40% of grant assured from NHAI, and no traffic/tariff risk, financial closure should not have been a problem for these developers – but for the current state of the financial sector.

Rs 400bn of HAM projects, with a debt requirement of Rs 190bn, are pending FC

	Total HAMs	Won in FY18	FC achieved	FC Pending	Project Cost (Rs mn)	Debt required (Rs mn)
Sadbhav Infra	12	6	2	4	41,130	19,742
Ashoka Buildcon	7	5	-	5	55,388	26,586
KNR Construction	5	5	3*	2	24,010	11,525
PNC Infra	7	3	-	3	45,130	21,662
IRB Infra	3	3	-	3	55,080	26,438
Dilip Buildcon	17	11	3*	8	1,12,078	53,797
MEP infra	10	4	-	4	41,057	19,707
Welspun Ent	6	3	2	1	20,045	9,622
Total	**67**	**40**	**10**	**30**	**3,93,918**	**1,89,081**

Source: Companies, PhillipCapital India Research *(*Sanction letters received)*

Currently 11 PSU (Public Sector Units) banks are under PCA (Prompt Corrective Action) – making them incapable of lending to HAM projects. Three more banks are likely to slip into PCA (as per our banking analysts) over next few quarters. At the same time, SBI (largest lender to infrastructure sector) has been 'reluctant' to lend to HAM projects. SBI's primary concern has been the low equity stake of the developers in these projects, low O&M cost quoted by developers and a relatively new model.

This means that as much as 85% of the institutional capacity (table below), which lends to the sector, is currently unwilling/incapable of lending for HAM projects. Therefore, it does not seem completely improbable that many of the recently won HAM projects may not be able to achieve FC and might have to be cancelled.

A significantly large section of the banking system is currently reluctant to lend to HAM projects

		Infrastructure Exposure			Total Exposure		
Rs mn	**Status**	**FY16**	**FY17**	**FY18**	**FY16**	**FY17**	**FY18**
Allahabad Bank	PCA	2,12,810	1,73,654	2,28,051	15,77,072	15,81,034	21,04,054
IOB	PCA	NA	NA	NA	NA	NA	NA
Dena Bank	PCA	1,02,928	1,14,657	1,16,257	8,23,283	7,25,746	7,42,386
Corporation Bank	PCA	2,21,796	2,11,784	1,97,341	14,57,064	14,57,098	12,80,053
CBI	PCA	4,78,192	4,92,195	4,28,667	29,31,280	32,09,294	28,81,564
IDBI	PCA	6,46,334	6,05,161	5,26,989	27,90,538	26,51,142	25,08,716
UCO Bank	PCA	2,37,036	1,81,011	1,77,720	13,55,081	13,16,550	12,29,476
United Bank	PCA	NA	NA	NA	NA	NA	NA
Bank of Maharashtra	PCA	1,39,393	1,10,544	94,470	12,34,259	11,60,000	10,92,047
OBC	PCA	2,16,638	1,74,710	1,45,730	15,36,394	16,64,380	14,82,060
Bank of India	PCA	4,60,905	4,47,187	4,40,830	39,31,438	41,17,190	40,20,804
Total PCA		**27,16,032**	**25,10,902**	**23,56,055**	**1,76,36,409**	**1,78,82,434**	**1,73,41,159**
PNB	Poss Slip	3,89,249	5,34,576	4,63,172	47,02,634	44,91,426	47,83,958
Syndicate Bank	Poss Slip	2,97,652	2,75,144	2,56,623	20,64,493	20,70,648	22,33,461
Union Bank	Poss Slip	3,42,408	4,03,268	5,33,384	27,77,253	30,15,971	15,60,918
Total Possible Slip		**10,29,310**	**12,12,988**	**12,53,179**	**95,44,381**	**95,78,044**	**85,78,337**
State Bank of India	**Not Lending**	29,75,602	26,49,685	28,03,138	1,92,87,150	1,98,10,540	2,07,44,626
Total "Not Lending" Banks		**67,20,943**	**63,73,575**	**64,12,372**	**4,64,67,939**	**4,72,71,018**	**4,66,64,122**
Yes	Active	1,84,774	2,74,051	3,60,820	14,69,984	18,22,445	27,18,123
Axis	Active	2,64,146	2,32,289	2,19,675	48,32,151	57,59,184	64,41,091
ICICI	Active	3,27,011	2,68,208	2,51,644	79,83,539	78,65,010	88,11,586
HDFC	Active	1,80,688	2,39,305	3,08,400	54,64,747	65,70,002	78,41,860
Total "Lending" Banks		**9,56,619**	**10,13,853**	**11,40,539**	**1,97,50,421**	**2,20,16,640**	**2,58,12,660**
"Not Lending" as % of Total		***88%***	***86%***	***85%***	***70%***	***68%***	***64%***

Source: Companies, PhillipCapital India Research

We note that a similar concern had cropped up in the first round of HAM awards (during 2016-17) – when none of the projects awarded in early 2016 were able to achieve financial closure until Aug 2016. Then, NHAI had held meetings with various financial institutions, pacifying their concerns over the model. This had led to the financial closure of most projects by mid-2017. While the government is likely to intervene again, the problem of large number of banks being under PCA would mean that they would be able to achieve little. It is likely to boil down to **'rationing'** of financial closures for these projects – in turn, determined by the overall credit worthiness of the developer and the project dynamics.

Also, we note that our analysis is restricted to publicly listed players, for whom the data is available. There are other large private players (like GR Infra, APCO, Monte Carlo, Oriental, Agroh) which have accumulated significant number of HAM projects – large number of them, yet to achieve financial closure.

Developers looking for alternate sources of financing

Anticipating this, many developers have started approaching NBFCs to fund their HAM projects. This step, while a temporary solution, will be negative due to two aspects:

1) It will adversely impact the IRR of these HAM projects – as the lending rate of NBFCs will be significantly higher than the baking institutions.
2) The NBFCs will not be able to provide a term loan of 10-15 years, due to their ALM (Asset Liability Mismatch) – which means the projects will have an incremental refinancing risk.

Our analysis reveals that the IRR of a HAM project falls by 150bps if the financing cost increases by 100bps. Meanwhile, many financing institutions are willing to finance only 35% of the BPC – translating into higher equity investment from the developers – further translating into lower equity IRR.

HAM model – IRR sensitivity to interest rate and share of debt financing

Equity IRR		Change in Interest rate for the company				
	11.6%	-1.0%	0.0%	1.0%	2.0%	3.0%
Change in share of debt provided	-30.0%	9.4%	8.9%	8.4%	8.0%	7.5%
	-20.0%	10.1%	9.5%	8.8%	8.2%	7.5%
	-10.0%	11.2%	10.3%	9.3%	8.4%	7.5%
	0.0%	13.0%	11.6%	10.1%	8.8%	7.4%
	10.0%	16.9%	14.2%	11.7%	9.4%	7.3%

Source: PhillipCapital India Research

Interestingly, a change in overall market lending rate (SBI PLR) will not have a major impact on the IRRs because the NHAI pays the developer interest on the outstanding annuities (linked to the SBI PLR). Hence, in the event of an increase in overall borrowing rate (e.g., a further interest rate hike by RBI), the increase in interest payments by NHAI will largely mitigate the rise in interest expense for the developer.

Recent updates on financial closure of HAMs

In the last few weeks, few companies (Sadbhav, Dilip) have announced financial closures for some of their HAM projects, while some others (KNR) have declared that they have received 'sanction letters' for the same. While these are encouraging signs, we note that these represent only a small part of the HAM projects in the market that are awaiting financial closure. We remain concerned about the ability of many of these developers to be able to achieve this within the mandatory timeframe of six months.

Expect a decent secondary market for HAM projects

Contrary to popular opinion, we believe there is scope and possibility of a strong demand for HAM projects in a secondary market – particularly in the InvIT format. In our report **here**, we had highlighted that out of the ~200 BOT projects with various developers in India, ~100 BOT projects were up for sale – with their owners looking for complete/part exit. But three years since the report, only a handful of transactions have materialized in this space.

Few deals in the BOT space have taken place, over the last four years, despite huge supply

Date	Investor	Company	Amount	Stake	Portfolio size (Rs mn)		Implicit Valuation	
			Rs mn	%	Project Cost	Equity	Rs mn	P/BV
May-12	IRB Infra	MVR Infra	1,280	74.0	3,076	842	1,280	1.52
Apr-13	Tata Realty & Infra	IVRCL - 3 projects	NA	74.0	22,055	5,876	NA	NA
Feb-13	SBI Macquarie	GMR - Jadcherla	2,060	74.0	5,155	1,620	2,784	1.72
Sep-13	IDFC PE	GMR - Ullundurpet	2,220	74.0	8,817	3,440	3,000	0.87
Nov-14	IDFC PE	HCC - Nirmal BOT	640	74.0	3,150	630	640	1.02
Oct-15	Cube Highway	Madhucon - Agra-Jaipur	2,480	74.0	3,680	994	2,480	2.49
Jan-16	Cube Highway	NCC - Meerut - Muzaffarnagar	970	51.0	7,476	2,255	1,902	0.84
Feb-16	IDFC PE	NCC - Bangalore Elevated	1,000	38.0	9,903	4,203	2,632	0.63
Feb-15	Gammon Infra	Sadbhav - Mumbai Nasik	720	20.0	7,020	1,195	3,600	3.01
Apr-15	Sadbhav Engg	HCC - Dhule Palasner	2,040	60.0	14,200	3,550	3,400	0.96
Oct-15	Ashoka Buildcon	PNC - Jaora Nayagaon	342	8.5	8,350	2,730	4,023	1.47
Dec-14	Canada Pension Plan	L&T - IDPL	20,000	NA	4,23,340	81,320	NA	NA
Aug-15	Brookfield AMC	Gammon Infra	5,630	100.0	NA	7,720	5,630	0.73

Source: PhillipCapital India Research

On similar lines, we had expected (**here**) that the IRB InvIT, which got listed last year on NSE, would do well and pave way for a new source of capital for the sector. But 12 months after its listing, it is trading 20% below its issue price, despite having delivered on its promised dividend. Three more companies announced their InvITs (Reliance Infra, GMR and ITNL), but had to withdraw their offers due to lack of investor interest. Eventually, L&T successfully completed its InvIT offering recently, but only for a 'private' InvIT (NOT a publicly listed one).

InvIT efforts have yielded poor results, so far ...

Company	EV (Rs bn)	Projects	Status	Listing price	Current price	% Returns
IRB InvIT	59.2	7	Listed	102	80	-22%
India Grid InvIT	30.0	2	Listed	100	96	-4%
Reliance Infra	83.4*	10	Listing cancelled due to inadequate response			
GMR Infra	NA	7	Listing cancelled due to inadequate response			
ILFS Transport	25.0*	4	Listing cancelled due to inadequate response			
L&T	33.2*	5	Under progress, to be floated as a private InvIT			

Source: PhillipCapital India Research *(*As per media reports)*

We see two main reasons for the failure of the InvITs in attracting investor interest:

1) The IRB InvIT and the other BOT InvITs that were floated eventually carried traffic and tariff risks to the expected yield. For debt/pension funds, this was a significant risk for the lower return (12-14%) that the instrument offered.
2) The InvITs did not do away (completely) with the interest-rate risk. Initially envisaged to be debt free, lack of consensus on valuations meant that they retained part of the debt on their balance sheets, imparting interest rate risk.

We see HAM projects addressing both these concerns in an adequate manner:

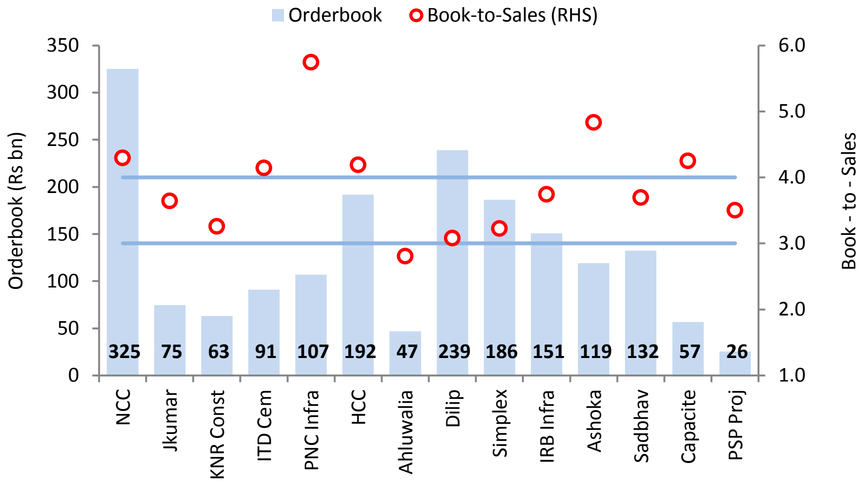
1) HAM projects do not carry any tariff/traffic risk – as the amount of annuities is fixed, and HAM projects do not involve any toll collection.
2) HAM projects have, as one of their cash inflow streams, interest on the outstanding annuity payment that is linked to the benchmark lending rates. This largely mitigates the interest-rate risk to the expected yields.

Consequently, we expect a good secondary market for HAM projects – both as individual investments from PE investors, or in the form of an InvIT structure.

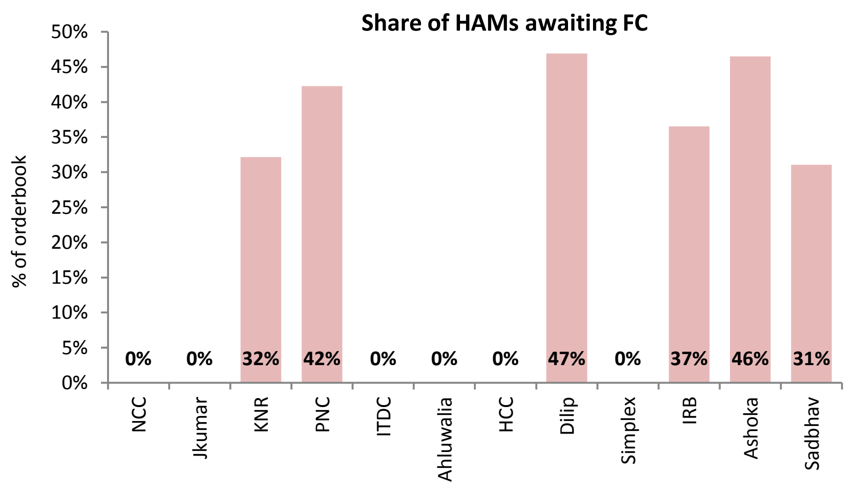
Prefer players with lower HAM exposure

Our Q4FY18 'orderbook keeper' (read here) demonstrates that almost all EPC companies currently have strong orderbooks, representing >3x book-to-sales. However, the composition of the orderbooks for a few players paints a lesser sanguine picture, because of the high share of HAM projects that are awaiting Financial Closure (FC).

While most construction companies have strong orderbooks (>3x book-to-sales) ...



.. a large part of the orderbooks comprises of HAMs awaiting FC (KNR, PNC, Ashoka, Sadbhav, IRB, Dilip)



Source: Companies, PhillipCapital India Research

Pecking order

In accordance with the concerns related to HAM projects and its financial closure, we prefer companies with:

1) NO HAM projects – NCC, Ahluwalia, J Kumar
2) Fewer HAM projects awaiting FC – KNR Construction
3) Relatively stronger balance sheets – PNC, Ashoka, Sadbhav

The above pecking order, takes into account, only the absence/presence/share of HAM projects in the orderbook. Our overall recommendation for individual stocks is determined by many other factors (growth outlook, segmental presence, strength of balance sheet etc) – and may differ from the above preferences.

Rating Methodology

We rate stock on absolute return basis. Our target price for the stocks has an investment horizon of one year.

Rating	Criteria	Definition
BUY	>= +15%	Target price is equal to or more than 15% of current market price
NEUTRAL	-15% > to < +15%	Target price is less than +15% but more than -15%
SELL	<= -15%	Target price is less than or equal to -15%.

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