

Financial Analysis of Build-Operate-Transfer (BOT) Model : A Case Study for Semiconductor Industry

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The term BOT (Build-Operate-Transfer) is becoming popular in these days for many industrial segments. Few years back the term was very prevalent for infrastructure projects. Later this concept is being implemented in many sectors such as Energy, Telecom, Construction, Heavy Industries & Semiconductor etc. In general Semiconductor companies need large investments for either fabless design centers or establishing foundry units. It is a challenge for few companies to setup such companies with their own funds. The best alternative is to explore feasible models such as BOT.

In the recent years many US & Europe companies are setting up their offices in low cost geographical regions such as India, China, Taiwan & Malaysia etc. While setting up these units they are opting for BOT Model which enables them to leverage many advantages such as - little capital required in initial stage, readily available productive team, synchronized with overall eco-system companies & established connections with customers/partners. However there are certain areas such as security of information, working capital to run the organization and cultural fitment after transfer should be addressed appropriately.

The case study considered here for financial analysis of a middle size semiconductor company in US engaged with a semiconductor solution provider organization in India to establish the team and infrastructure, run for certain duration to stabilize and later transfer ownership to the parent company to have their presence in India. The financial figures indicated in this case study are indicative. The key take away from this paper is to understand how BOT model works, what factors to be considered and how the model can be financially feasible for parent/acquiring company.

Keywords: BOT, Financial, Cost, Semiconductor

Introduction

The term BOT stands for Build-Operate-Transfer, each term is defined below:

Build - Setup the facility and infrastructure, staff the design center, define processes, obtain necessary tools and establish knowledge transfer.

Operate - Manage the established team, Identify the challenges, Execute the project in a progressive cycle & Enable the team ready for productive work.

Transfer - Register a new offshore subsidiary for the customer, provide offers to employees for new company, transfer assets, and handover operations

The term BOT is very popular in earlier days for infrastructure projects. The infrastructure in general need of large and immediate investment, the funds provided by public agencies are not nearly sufficient to face such a challenge. BOT is a delivery/financing system that can be a solution to this problem. In this system, a private sponsor finances the design, construction, maintenance, and operation of a public project for a specified concession period, at the end of which it transfers ownership to the government agency, hopefully after recouping its costs and achieving profits.

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Later this concept is being implemented in many sectors and Semiconductors is one of them where it needs large investments. In this paper the main focus is on financial analysis of BOT Model for Semiconductor industry.

BOT Enablers

Global corporations are exploring options to setup their offices in cost optimized and fast growing countries such as India & China. There are few options to setup their units:

- Build the team from beginning
- Purchase similar domain unit
- Go for a BOT Model with vendor

Build from scratch is very challenging task as it needs lot of time to setup, obtain right talent quickly and fitment into single global culture etc. Purchase similar domain is feasible option but some of the mergers are expensive and not sure about their success due to churn in middle & lower level resources after merger or acquisition. The Build-Operate-Transfer (BOT) model offers an attractive alternative.

BOT offers significant business benefits over the other options described above:

- Quick mobilization of relevant talent from vendor firm
- Ensuring the cultural fitment of team with global teams
- Ease in handling all government & compliance requirements
- Rapid scaling of operations in meeting time to market
- Optimizing overall cost of operations
- Leveraging process and procedural expertise from vendor
- Make available skilled team to operate productively
- Establishing market connections to grow business
- Ability to retain Intellectual Property (IP) rights

Some of the concerns that need to address appropriately are:

- Quality & timely deliverables in the beginning
- Secure infrastructure & confidential information
- Maintain transparency in all items / activities

Literature Review

In the paper "Build-Operate-Transfer (BOT) Arrangements: The Experience and Policy Challenges" by Adora Navarro indicates that A look into projects under the Philippine program of public-private sector partnerships during the period 1999-2003 showed that participation of the private sector has been declining. This paper analyses the challenges of BOT type contract and identify issues / problems. Based on the study, the paper recommends necessary actions to be taken to minimize the issues.

In the paper "Risks and Mitigation Measures in Build-Operate-Transfer Projects" by Syed Kamarul Bakri Syed Ahmad Bokharey, Kalaikumar Vallyutham, Narayanan Sambu Potty and Nabilah Abu Bakar indicated the importance of infrastructure investments in East Asian countries and the significant role played by BOT to raise funds & complete infrastructure projects successfully.

Objective

This paper is focused on the following objectives:

- Understand how the BOT model works and its relevancy to execute projects from semiconductor industry with case study
- Calculate the detailed cost or financials required in case the defined project or the work to be executed from India and later transfer to parent company
- Estimate the approximate acquisition cost (detailed calculations are not considered in this paper) if the USSemi decided to purchase similar domain company
- Compare the financial feasibility in both the cases and evaluate the other factors to take decision on Build-Operate-Transfer (BOT) model

- At the end of the analysis one should be in a better position to understand BOT model and its financial analysis to take decision.

Scope

This paper writing is mainly focussed on the project or work executed for semiconductor industry. The main coverage in this paper is financials though other parameters are covered in a very minimal effort. For the security reasons the actual company names are not disclosed, however the US Semiconductor company name is referred as "USSemi" and Indian Semiconductor company name is referred as "IndSemi" throughout this paper.

USSemi has a requirement of setting up their office in India to work on new or derivative semiconductor products for consumer electronics industry. They have two options - one is acquire the middle size company (about 80 resources) in India who is in the similar domain & skill set and second one is to outsource the work to service provider organization in India and later acquire the team who is working on their products.

In this scenario USSemi has approached IndSemi who has similar skills to develop the new chip proposed by USSemi. However USSemi has asked IndSemi to build team & infrastructure to develop the new chip, operate for certain period to stabilize the capabilities of the team and later transfer the working team to USSemi in India. The reason for this proposal is USSemi wants to have their operations established in their company name in India to have better visibility of their company and also use this team for developing more derivatives from this chip or develop new chips to meet the global requirements & optimize the cost.

Methodology

The methodology used to write this paper is as follows:

- Understanding the proposed work to be executed from India:

In this section the resource requirements for the USSemi projects will be indicated in the various levels.

- Cost estimation if it is executed from service provider:

In this section efforts are estimated if the proposed work to be executed from service provider in India and later transfer team as a part of BOT model

- Financials if USSemi proposed to acquire/purchase company:

In this section overall costing will be estimated if USSemi proposed to acquire or purchase similar domain company in India.

- Comparative analysis focusing on financials & other parameters

In this section financials & other parameters will be compared for proposed work to be followed either BOT model or Acquisition model.

- Prepare report to take appropriate decision

Finally summarize the observations and conclusive statement to review and take appropriate decisions for BOT model by USSemi with IndSemi

Analysis

USSemi has a proposal to setup about 80 resources in India for their additional need in projects. USSemi don't have operations in India. Initially the USSemi has tried to acquire the similar domain company with 80 resources. They have done the preliminary feasibility analysis to decide the acquisition deal. The cost of acquisition to purchase the similar domain company was 12,000,000 US\$

In parallel USSemi has interacted with IndSemi who can provide the required services. USSemi has indicated that they may take the entire team under USSemi name in India based on performance of team and financial feasibility after 2 years. USSemi has asked IndSemi to

engage 80 resources in different levels as indicated in the following table:

Sr. No.	Function / Role	Director	Manager	Lead	Engineers	Total
1	Program Management	1	1			2
2	Architecture		1	2	2	5
3	Design		1	4	5	10
4	Development		2	5	20	27
5	Testing		2	4	16	22
6	Implementation		1	2	5	8
7	Customer Support		1	1	4	6
	Total	1	9	18	52	80

Financial Calculations for BOT Model

The total cost of 80 resources + tooling cost +

operational cost per annum for providing the services by IndSemi is as indicated below (all values are in US\$):

Sr. No.	Cost Parameters	Cost Per Annum (US\$)	Remarks
1	Human Resource Cost	5,088,000	Resource cost for each level is different
2	Tooling & Server Cost	254,400	Design Verification and Physical Design Tools
3	Operational Cost	407,040	For Travel, Trainings, R&D, Infrastructure etc.
	Total Cost	5,749,440	

Based on IndSemi performance if USSemi decided to purchase the team then additional onetime costs are applicable as indicated below:

- Establishing new infrastructure =
254,400 US\$
- Premium to be paid to IndSemi =
5,088,000 US\$ (one year premium)

The human resource cost, tooling cost and operational costs for USSemi is different and the corresponding value is as indicated as per table on next page.

The year of transition cost for US Semi = (one time cost + variable cost)
= (5,342,400 + 4,452,000) = 9,794,400US\$

The total onetime cost to USSemi =5,342,400 US\$

Sr. No.	Cost Parameters	Cost Per Annum (US\$)	Remarks
1	Human Resource Cost	3,561,600	Lower than IndSemi as no Mark-up considered
2	Tooling & Server Cost	356,160	Tooling cost varies with different organizations
3	Operational Cost	534,240	Operational cost is higher due to dedicated facility
	Total Cost	4,452,000	Annual variable cost for USSemi

Observations

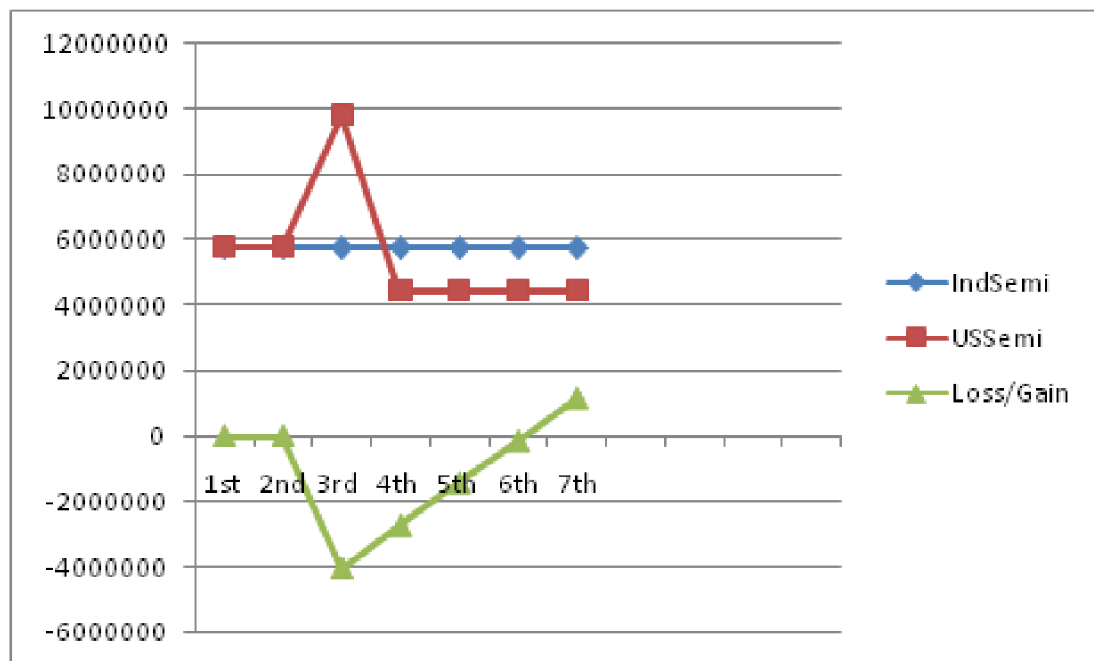
Following are the observations from above analysis:

- The USSemi can get financial benefit of BOT model after 4 years if it is decided to buy the team from IndSemi at the end of 2nd year

Option-1 : Financial analysis for BOT Model

Year	IndSemi (US\$)	USSemi (US\$)	Loss/Gain (US\$)
1st	5749540	5749540	0
2nd	5749540	5749540	0
3rd	5749540	9794400	-4044860
4th	5749540	4452000	-2747320
5th	5749540	4452000	-1449780
6th	5749540	4452000	-152240
7th	5749540	4452000	1145300

In the above table the cost includes resource cost + tooling cost + operational cost



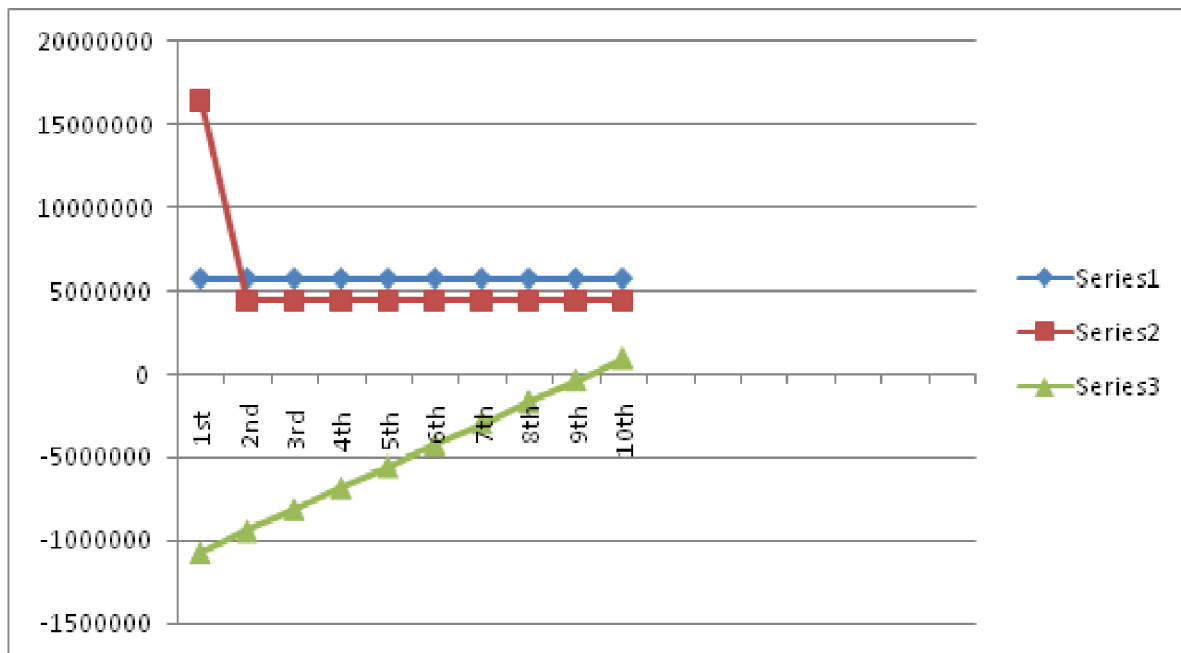
Option-2 : Financial analysis for Acquisition Model

- The USSemi can get financial benefit of Acquisition

model after 9 years if it is decided to buy the similar domain company in India.

Year	IndSemi (US\$)	USSemi (US\$)	Loss/Gain (US\$)
1st	5749540	16452000	-10702460
2nd	5749540	4452000	-9404920
3rd	5749540	4452000	-8107380
4th	5749540	4452000	-6809840
5th	5749540	4452000	-5512300
6th	5749540	4452000	-4214760
7th	5749540	4452000	-2917220
8th	5749540	4452000	-1619680
9th	5749540	4452000	-322140
10th	5749540	4452000	975400

In the above table first year cost is = Acquisition cost + USSemi cost



Following table indicates comparison of key parameters for both the options:

Sr. No.	Parameter	Option-1 BOT Model	Option-2 Acquisition
1	Duration required for break-even	After 4 years of transition of team	After 9 years of acquisition of team
2	Requirement of initial investment	Little investment required to engage with vendor team	More investment required to purchase the company at the beginning
3	Fitment of the team with new organization	Little time required to unify the team as the teams are already working from sometime	More time required to unify the team at operational level as the teams doesn't know each other till acquisition
4	Familiar with the processes, procedures and working models	Well familiar with all the artefacts of new organization as the teams are already using them from sometime	Need time to get familiar with artefacts of new organization as the team is not used earlier

5	Productivity & efficiency during execution	New organization can expect higher productivity and efficiency as the team is familiar with domain & technology used	New organization can expect lower productivity and efficiency in the beginning as the team is not well familiar with domain & technology used
6	Risk-Mitigation Strategy	New organization can decide not to engage in BOT model with vendor organization if the performance is not good	It is difficult to exit the acquired organization if the performance is not good

Assumptions

Few points to note in above analysis are:

- It is assumed that all 80 resources are available to work at Day-1 of start of USSemi project at IndSemi
- The resource cost is considered same in all years, however in reality it increases due to hike in salaries
- The IndSemi tooling cost is low as these tools can also be used for some other projects on sharing basis
- The IndSemi operating cost is low as these resources may be shared for many projects, however in USSemi they will be dedicated for this project. Also certain work space optimizations at IndSemi contributes to lower operational cost.
- Acquisition cost in Option-2 includes pre-acquisition cost, actual acquisition cost and post-acquisition cost.

Conclusion

Based on financial analysis & consideration of other parameters USSemi has selected to go for BOT model. Following points to be noted to make the BOT model successful:

- Global companies have to commit at least 2 to 3 years of continuous business to selected service provider in India.

- This model is feasible only when the global companies have plans to continue the operations in targeted region relatively longer time after transition.
- It is recommended to go for the BOT model if the service provider has agreed to transfer all levels of resources.

Following points considered to reduce the duration of recovery period in BOT model:

- Premium paid to IndSemi was negotiated and optimized.
- Salaries were optimized while transferred the team to USSemi.

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