Vol. 2, Issue: 7, August-Sept. : 2014
ISSN:(P) 2347-5404 ISSN:(O)2320 771X

Effects of Privatisation of Delhi Electricity Distribution under a Regulated Regime

ARJUN TEOTIA
Ph.D. (2013)
Delhi School of Economics

Abstract:
In view of the debate that weather privatisation is beneficial for the country or not, we investigate the effects of privatization of Delhi electricity sector under a regulated regime. Electricity demand has been empirically proved to be inelastic in urban areas and hence the efficiency aspect of electricity distribution was focused upon. In our analysis below, we found privatisation to be a boon for Delhi and no significant effect was observed on capital investment by distribution companies due to regulation.

Keywords: *Electricity sector, Privatisation, Regulated Regime*

1. Introduction

John Vickers and George Yarrow in their paper on "Economic Perspectives on Privatization" have characterized the privatization programs into three different kinds:

1. Privatization of competitive firms which involves the transfer of state owned enterprises operating in competitive product markets free from substantial market failures to the private sector.
2. Privatization of monopolies which transfers the state-owned enterprises with substantial market power to the private sector, like network utilities in telecommunications or electricity.
3. Contracting out of publicly financed services, previously performed by public sector organizations, to the private sector.

Governments frequently retain some rights of control, in the form of regulation, where monopoly power and other market failures are present. The simple approach assumes that privatization entails the transfer of all decision-making authority to private hands. But is it credible or desirable for there to be no government intervention in the decisions taken by the firm?

Sappington and Stiglitz (1987) argue that privatization affects the transactions costs of government intervention in enterprise decision-making. For example, subsidies to loss making activities are fairly common under public ownership. Where monopoly power (or other externalities) is important —that is, in type 2 privatization which is the case we are focusing upon—intervention by government is likely to be desirable on welfare grounds and regulation is called for. When a firm is both privatized and regulated, much depends upon the nature of the game between the firm and the government. For example, if the firm chooses sunk investment expenditures to reduce costs, it runs the risk that the government might opportunistically decide to enforce low prices, without allowing the firm to recover its costs. It can give rise to problems of underinvestment.

2. Theoretical Background

Delhi Electricity Supply was traditionally supplied by Delhi Electricity Supply Undertaking (DESU) which had the responsibility of generation, transmission and distribution of electricity to the New Delhi Municipal Corporation (NDMC) and Military Engineering Services (MES). But its dismal performance led to the formation of Delhi Vidyut Board (DVB) in 1997. But it didn't lead to any

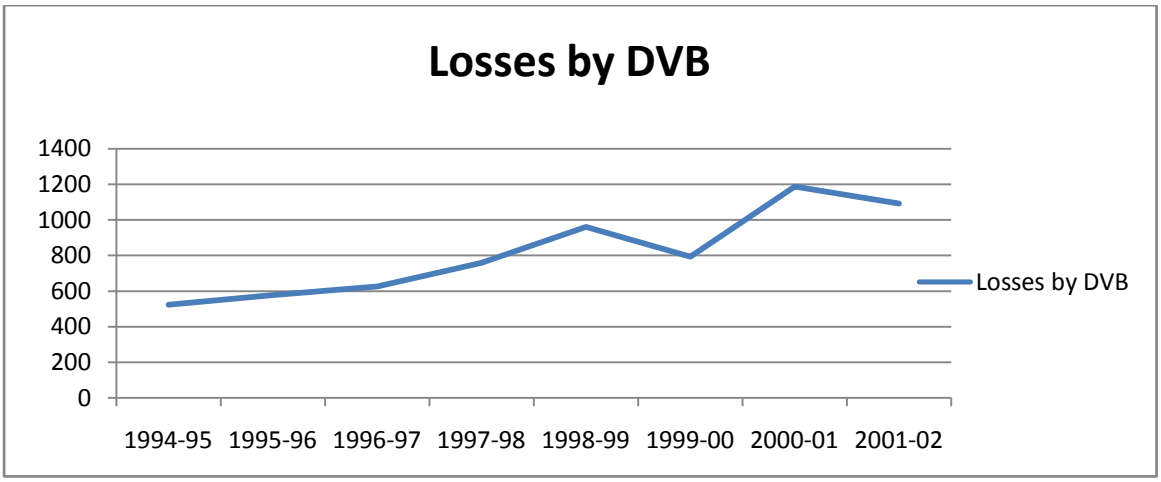
structural change and only its legal status was changed. Therefore the functioning and the work ethics of the organization had no effect at all and the poor performance continued to suffer.

The Power sector was old and obsolete infrastructure with very poor maintenance and almost no capital augmentation, and also suffered from high commercial losses.

2.1 Financial Problems

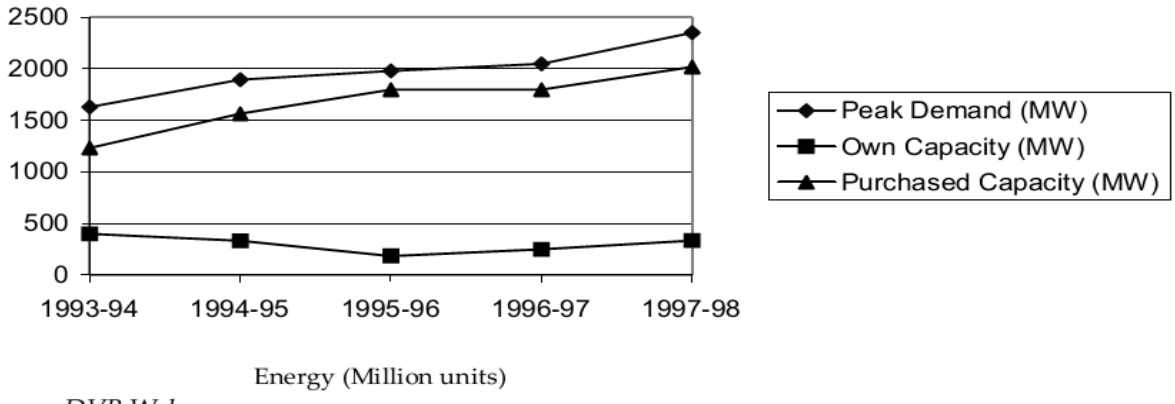
During the period of 1994-2001 the operating losses for Delhi Vidyut Board rose from Rs 524 crore in 1994 to Rs 1186 crore in 2000-2001. Reasons as given by the board were

- The billing system was inaccurate and inefficient. Of the 57.3% electric power distributed in 1998 only 57.3 of it was billed and of it around 88% was collected as revenue.
- By 1999, the board had a deficit of around 6500 crore and owed almost 1000 crores to several organisations.



2.2 Demand and Supply Imbalance

The state also suffered from Demand and Supply Imbalance. Although the demand for the energy kept increasing throughout the period but the power supply from the plants remained stagnant. In spite of having an installed capacity of a good 700 Mega Watts it could not generate more than 300-350 MW. The biggest reason for it was the archaean power generating stations. Due to their old age they consumed high amounts of fuel which resulted in very low production rate. Peak demand continued to increase but was not compensated by an in increase in capacity. The increase in purchased capacity further led to decrease in earnings of DVB making it unable to sustain.



Source: DVB Webpage

2.3 Aggregate Technical and Commercial (AT&C) Losses

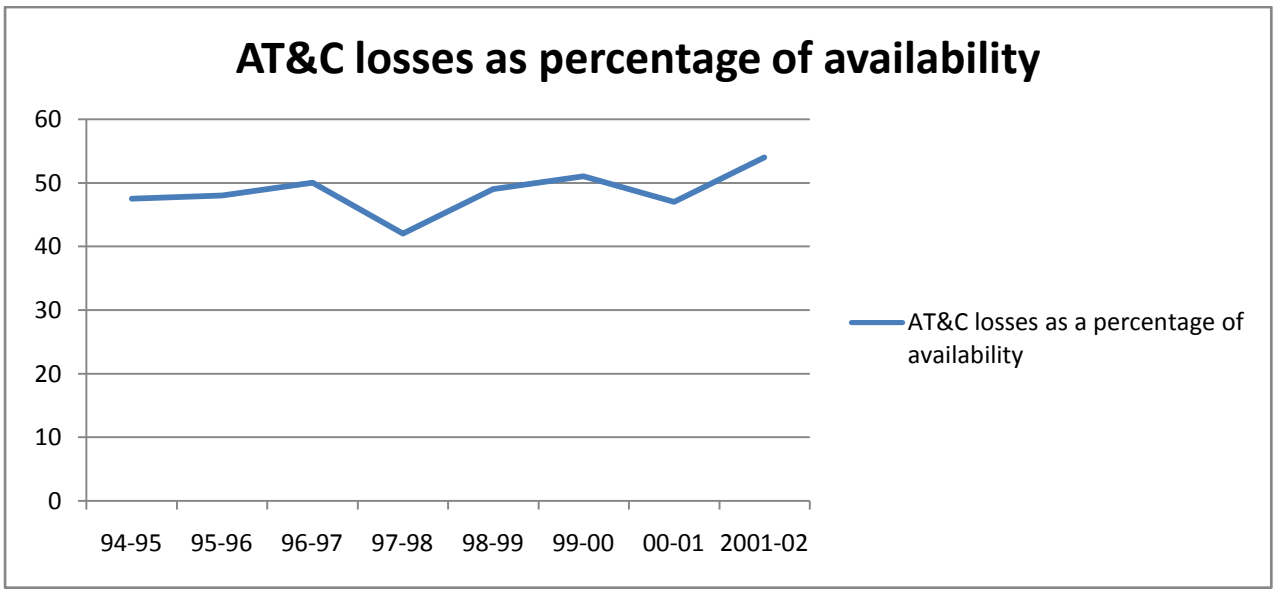
AT&C losses are sum total of technical losses, commercial losses and shortage due to non-realisation of total billed amount. Lack of adequate investment leads to overloading of transformers, leading to

overheating and therefore high technical losses. Theft and pilferages of power along with inefficient meters result in commercial losses.

In the period 1994-2001, AT&C losses ranged from 40-54% of the total power. There are various reasons for such a high percentage.

- Theft was the biggest reason behind it which included those consumers too who had meter installed in their places. It was prevalent in domestic, commercial as well as industrial establishments.
- Those who lived in illegal colonies had no way of getting the power to their houses which more than often led to illegal tapping of the power.
- Also many consumers would exceed their consumption limit and the tamper with the meters so as to get saved from high bills.

The government due to its **populism and electoral** politics did not act reproachfully and issues of AT&C losses could never be solved.



AT&C losses continued to remain high with no signs of improvement.

3. Regulatory Reforms

Understanding and identifying the problems being faced by the power sector of Delhi , the Government in 1999 decided to give it a serious look and emphasized on the urgency of reorganizing the DVB. It concluded that high amounts of finances were required to improve the present condition and this wasn't possible under the present environment of the board. It decided to take the following steps:

- Set up of a Delhi Power Generation and Transmission Company
- To invite private investors for joint ventures who can bring in new look and direction in the power sector.
- Set up of new power distribution companies and invite private companies to bid for it.
- To establish an independent Delhi Electric Regulatory Commission which would look into the licensing of new capacity, building certain performance standards and fixing tariffs.

At the end of December 1999 Delhi Electricity Regulatory Commission was setup and By the Delhi Electricity Reform Act, 2001 a new legal framework was formed for the restructuring and privatisation of the power sector.

In January 2001, Delhi Vidyut Board was broken into six entities: one holding company, one generation company (GENCO), one transmission company (TRANSCO), and three distribution companies (DISCOMS).

Of all the bidders TATA Powers got the share of 51% of the North whereas Bombay Suburban Electricity Supply (BSES) got the distribution over South west, Central and East Delhi. DISCOMS which came into existence were North Delhi Power Limited (NDPL) now Tata Power Delhi Distribution Limited (TPDDL), BSES Yamuna Power Limited, BSES Rajdhani Power Limited.

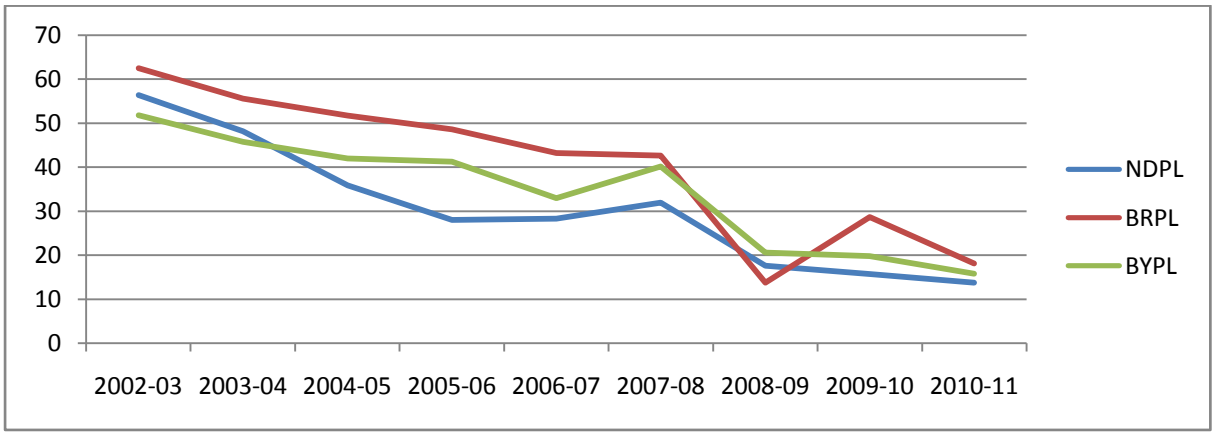
Agreement was made between the distribution companies to bring down the AT&C losses down to 34% within five years.

4. Computation and treatment of over/under achievement of target AT&C loss levels

- In the event the actual AT&C loss of a distribution licensee in any year is better (lower) than the level based on the minimum AT&C loss reduction levels stipulated by the Government for that year the distribution licensee shall be allowed to retain 50% of the additional revenue resulting from such better performance. The balance 50% of additional revenue from such better performance shall be counted for the purpose of tariff fixation.
- In the event the actual AT &C loss of a distribution licensee in any year is worse (higher) than the level based on the AT&C loss reduction levels indicated in the Accepted Bid for that year, the entire shortfall in revenue on account of the same shall be borne by the distribution licensee.
- In the event the actual AT&C loss of a distribution licensee in any year is worse (higher) than the level based on the minimum AT&C loss reduction levels stipulated by the Government for that year but better (lower) than the level based on AT&C loss reduction levels indicated in the Accepted Bid for that year, the entire additional revenue from such better performance shall be counted for the purpose of tariff fixation.

5. Effects of privatisation

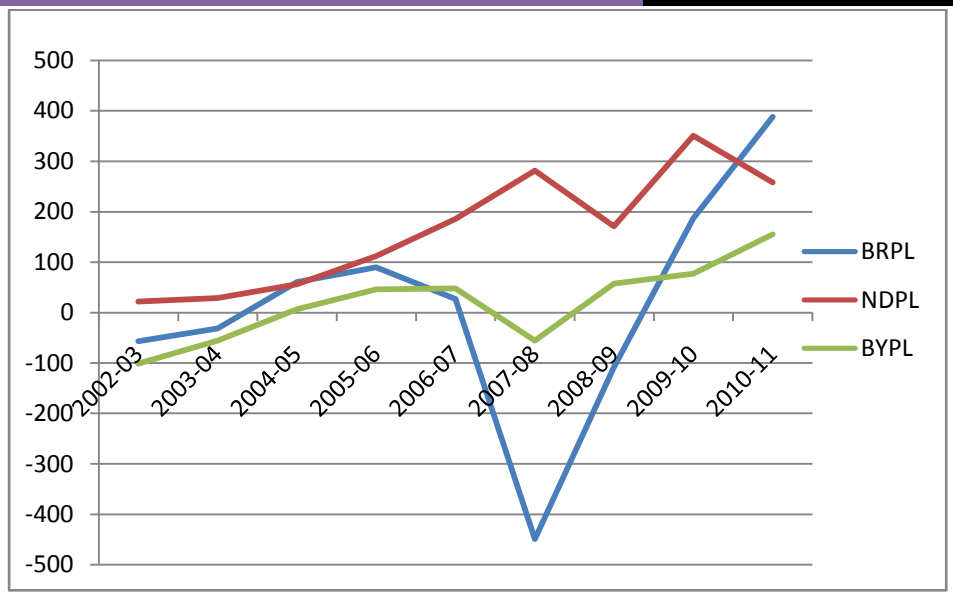
As mentioned above AT&C losses were one of the main reasons for the privatisation of distribution companies. The companies took a number of steps to reduce these losses which resulted in reduction if AT&C losses from 56% in 2002 to 38% in 2007. Amongst all, NDPL recorded the maximum reduction in transmission and distribution losses.



5.1 AT&C losses

5.1.1 Financial Position

Post privatisation the financial position of the company's improved. All the three DISCOMS shows profits starting from 2004-05. Though NDPL has shown to be in profit consistently BSES registered losses in 2007-08 due to a increase in its purchase cost. The financial situation has significantly shown a positive transformation as compared to the pre privatisation scenario.

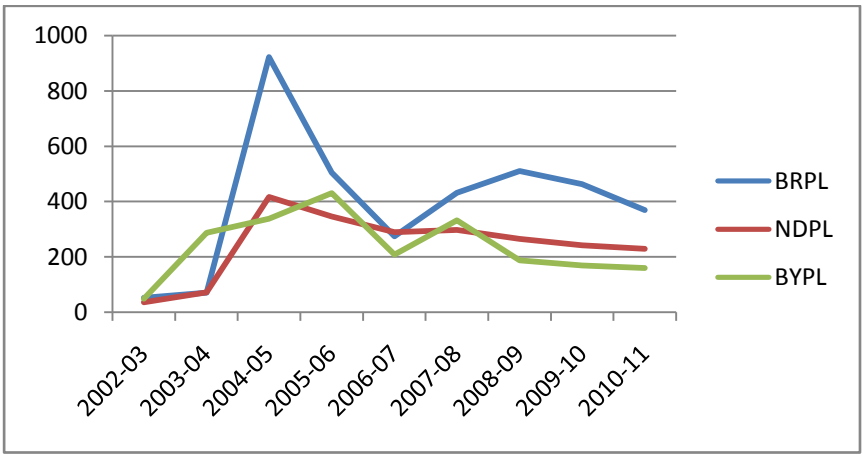


5.2 Profits/Losses in crores suffered by DISCOMS

Difference between Average Cost and Average Revenue has increased from 10 paise/kWh in 2002-03 to 50 paise/kWh in 2007-08. The financial deficit condition has improved in Delhi and has gotten reduced from 9.2% in 2002-03 to nothing in 2008-09.

5.3 Capital Expenditure

As opposed to no capital augmentation in pre privatisation scenario, DISCOMS, in order to run the business profitably, incurred huge capital expenditure. The major expenditure was on setting up of infrastructure aimed at reduction of AT&C losses.



The Energy deficit has gotten decreased from 1.9% in 2002-03 to 0.6% in 2008-09.

5.4 Data Sources

- The data for AT&T losses and profits of the DISCOMs have been taken from indiastat.com.
- The data for Capital expenditure for BRPL and BYPL was taken from the Annual reports of the individual company website.
- We are also thankful to one of the NDPL executives for providing us with the data for the capital expenditure incurred NDPL.

5.5 Empirical Analysis

Using the data from 2002 till 2011, we tried to investigate the impact of AT&C reduction and Capital expenditure on the profitability of the DISCOMs. Combining data points for all three discoms, we had 27 data points over a period of nine years. The following results were observed.

	Coefficient	Std. error	t	P>|t|	95% Conf. Interval	
Atclosses	-5.898635	1.930975	-3.05	0.005	-9.883972	-1.913298
capital exp	-.0395039	.1520811	-0.26	0.797	-.3533839	.2743761
_cons	284.2079	89.14683	3.19	0.004	100.2179	468.1979

R-squared = 0.2800
Adj R-squared = 0.2200

Since the time series data was used to analyse the impact on profitability, we checked the presence of serial autocorrelation by using the Durbin-Watson test statistic. The DW statistic came out to be 1.17 which confirmed the presence of positive autocorrelation. The same was corrected using Prais Winsten transformation by running a Cochrane-Orcutt AR(1) regression. The following results were obtained:

	Coefficient	Std. error	t	P>|t|	95% Conf. Interval	
Atclosses	-6.831644	2.212438	-3.09	0.005	-11.40842	-2.254868
capital exp	.0101804	.1439492	0.07	0.944	-.2876012	.3079621
_cons	296.6624	100.7774	2.94	0.007	0.007	

R-squared = 0.2974
Adj R-squared = 0.2363
Durbin-Watson statistic (original) 1.170463
Durbin-Watson statistic (transformed) 1.605925

6. Results

The coefficient of Atclosses is negative and significant. For every percentage decrease in AT&C loss leads to 6.83 crore increase in the profits of the Distribution Companies on an average. This is in accordance to our analysis since the main rationale for Privatization reforms was to reduce the AT&C losses. But as mentioned earlier, Delhi Vidyut Board wasn't able to control the surge in high transmission costs; it had decided to introduce private players. Also since the AT&C losses directly affect the operating expenditures of a company we see that decreasing the AT&C losses even by small percentage leads to increase in profits.

Secondly, we observe that the coefficient of capital investment by the DISCOMs is highly insignificant although we noticed earlier that there were high investments by the companies till 2007-08 and have maintained almost steady since then. The reason could be that capital expenditure is a long term investment and starts showing profits to the companies after a considerable amount of time. Therefore capital investment may be seen as an insignificant factor today but will be an important contributor to profits in the future.

7. Limitations

We have a data set which ranges from 2001-02 to 2010-11 which is a considerable short period and hence the trend observed might not be accurate and contain certain outliers.

8. Conclusion

We conclude that privatisation under regulation has been highly successful in Delhi, which has also been claimed by a report on power sector by SBI cap securities in October 2012 and has saved around Rs 30,000 crores for the Delhi Government. This money had been used to initiate various schemes to improve the standard of living of the people. It also said that unlike the power privatisation of Odisha which was a partial success Delhi's model had been a complete success and other states should also replicate such models.

Deficit condition has also improved. Peak deficit has come down from 9.2% in 2002 to 0.1% in 2012 and energy deficit has gotten reduced to 0.3% in 2012 from 1.9% in 2002.

Even the financial condition of the DISCOMs has improved substantially making power distribution a sustainable business.

Capital investment reduces the costs and Government after observing this might set low prices strategically. In such cases, private companies have no incentive to invest since they won't be able to recover their sunk expenditure and cover their costs. But since the time span in our analysis above comprises of the initial phase of setup and restructuring, we were not able to observe a trend of underinvestment or overinvestment which might have taken place because of regulation.

References

1. Economic Perspectives on Privatization : John Vickers and George Yarrow (1991-Pages 111–132)
2. Elasticities of Electricity Demand in Urban Indian Households by Massimo Filippini Shonali Pachauri CEPE Working Paper Nr. 16 March 2002.
3. Delhi Transco Limited - Wikipedia, the free encyclopedia.html
4. Capital Investment plans 2002-2007 of BYPL, BRPL and NDPL.
5. Privatisation of Electricity in Delhi by Michael Stammingerwoking paper no. 32
6. Power Sector reforms in Delhi: An enquiry into outcome of reforms, claims of power sufficiency and the road ahead Submitted to Centre for Civil Society by Paras Malhotra & Shivraj Singh Negi, Working Paper No 228.