Impact of Disinvestment on Financial Performance of Select PSUs Post Liberalization

* Rakhi Singh
** Vijay Agrawal

Abstract

The objective of this paper was to assess and analyze 20 financial ratios pertaining to profitability, operating efficiency, leverage, and liquidity of selected PSUs that had undergone disinvestment. The approach of disinvestment was welcomed in 1990s as a wholesome solution for sustainability of PSUs. This paper analyzed the profitability, liquidity, and solvency ratios of disinvested 37 listed PSUs of Maharatna, Navratna, and Miniratna categories and belonging to both manufacturing and service sectors. PSUs were once referred to be temples of modern India, but many of them got derailed from the profit - making objective post liberalization and turned to be wealth drainers. The PSUs were suddenly exposed to global competition which they were not used to since operating under a protected environment. The reforms were initiated out of compulsion as most of the PSUs were reeling and became uncompetitive in an open economy. The level playing field and competition stained the financial performances of the PSUs. The paper discussed the profitability, liquidity, and solvency ratios over a period of 16 years and analyzed the performance of the PSUs by focusing on factors of their sustainability. Further, this paper explored the impact of disinvestment on financial feasibility of the PSUs over two phases each of eight years based on volume of disinvestment in order to correlate the performance of PSUs phase-wise for understanding the disinvestment process vis-à-vis their prospects of sustainability.

Keywords : financial ratios, sustainability, disinvestment, PSUs

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T he self - obligation initiated with MoUs in the year 1987 - 88 and thereafter the disinvestment exercise from 1991-1992 entirely changed the dynamics and functioning of PSUs. The disinvestment process was primarily focused to offload government equity primarily of profit making PSUs. The entire idea behind the move was to resurrect the Indian economy. The prudent argument while accepting the disinvestment policy was whether the Government will forego dividends on the equity holdings by selling off its stakes. Despite the adoption of the disinvestment policy, several PSUs are still struggling to turn in profits in the wake of the collapse in commodity prices, changes in regulations, and weak order books. The Industrial Policy Statement 1991 (2000) clearly acknowledged that many PSUs had become a burden rather than assets to the government due to locational factors, too many promises to keep, poor project planning, delay in execution of projects, neglect of completed projects, uneconomical pricing policies, changes and vacancies at the top, and labour indiscipline.

* Research Scholar, Department of Management, Birla Institute of Technology Mesra, Patna Campus, Patna - 800 014, Bihar. (E-mail : rakhi4001@gmail.com) ; ORCID ID: https://orcid.org/0000-0002-9544-8101
** Professor - in - Charge, Department of Management, Birla Institute of Technology Mesra, Patna Campus, Patna - 800 014, Bihar. (E-mail : vijayag@gmail.com)

Disinvestment Policy and Sustainability

The problems faced by sick and loss - making PSUs included resource crunch, erosion of net worth due to continuous losses incurred by the PSUs, followed by reluctance of financial institutions to provide funds for revival. *Disinvestment Manual (2003)* by the Government of India (2003) suggested that the country would do well following the footsteps of Western experiences. Moreover, the country would be careful with the drawbacks responsible for the setback of other Asian economies while adopting disinvestment methodologies. Arnold, Javorcik, Lipscomb, and Mattoo (2016) explained the benefits of privatization linking with the pace of reforms out of compulsion in 1990s. The authors analyzed that the service sector has benefited more than the manufacturing sector ; whereas, the liberalization policies mainly targeted growth of the manufacturing sector. Shivendu (2008) found that privatization programmes were more because of politicians' pragmatic cost-benefit trade-offs, and the fiscal pressure induced privatization did not form any pattern on quantum and proportion. He proposed a political economy model of privatization and showed three major findings. First, the privatization percentage is slanted depending upon the institutional quality parameter relative to a measure of private sector efficiency ; the distortion increases as the institutional quality declines. Second, the enthusiasm and determination of private buyer declines with the decline in the institutional quality. Third, under heterogeneous preferences of citizens, the privatization proportion declines.

Sabnavis (2009) suggested that disinvestment should not be treated as dilution of the governmental stake ; rather, it should be considered as an IPO where the share capital remains intact and the money goes a premium to the "reserve account." The author re-examined the disinvestment scheme which became more of compulsion by creating a separate disinvestment department since 1991. The privatization process was limited to the extent of 49% in certain non-critical sectors with the reiteration of Rangarajan Committee (1992). The Committee, while raising question on the deployment of funds from the disinvestment proceeds, strongly felt that if the objectivity was to enhance the performance and operational efficiency of the PSUs, then the proceeds of the disinvestment from such enterprises should be re-ploughed back to strengthen the capital base rather than being used as a panacea for managing the government fiscal deficit continuously. This report also recommended prioritizing disinvestment first for loss-making PSUs then only for profit-making ones. Raj (2012) mainly reported the new government guidelines and proposed changes in the system of MoU. These guidelines proposed to have a review mechanism and appeal mechanism for Maharatnas and Navaratnas for revision of targets in view of changes in the business environment. It was also proposed that the investment plans provided by the PSUs would also be built into MoUs to facilitate fair appraisal of the performance. Sharma (2012) highlighted the importance of MoUs for nearly 200 PSUs, which were making profit since performance related incentives are easier to determine. He felt that real challenge before the government is to bring loss-making PSUs under the scope of the MoU system.

Mohapatra (2012), in his descriptive study, narrated the role, importance, and usage of the MoU system and observed that the MoU system was essentially a 'performance contract' undertaken by the management of the PSUs to the government – the owner of the PSUs. Narta, Verma, and Singh (2010) conducted a study mainly in minerals and metals units, where disinvestment was limited to 25%, and the authors found that the initiation of disinvestment measures on selected units of this sector became successful. Naresh, Thiyagarajan, and Mahalakshmi (2011) examined the disinvestment with DEA approach and identified that most of the disinvested PSUs were efficient in management of their financial resources, and they could be profitable. The authors believed that the public sector in India holds immense potential and prospects for growth and profitability, and they play an important role in the Indian economy. Ramakrishnan and Sandhya (2010) measured the performance of disinvested PSUs on liquidity, profitability, and the asset utilization dimension of financial performances and found that while disinvestment caused improvement in financial performance, the mode of disinvestment was the critical factor affecting the financial performance. The authors emphasized on the required strategy from the

government to take care of timing, methods, and mode of disinvestment in order to realize the maximum results from the whole process. Singh, Bansal, and Sukhija (2009) found disinvestment helpful in reducing costs and increasing revenue. Budhedeo and Pandya (2018) investigated the financial performance of public sector banks in India in the post reform era and revealed that the decline in financial performance was noticeable after 2013 - 2014. Joshi and Desai (2019) examined the financial restructuring and its impact on operating performance of the Indian energy sector using t - test and found significant impact on the operating performance of financial restructuring in all factors except turnover. Chitta, Jain, and Sriharsha (2019) applied Altman's Z score model to evaluate eight Maharatna companies of India and concluded that the financial health was important for survival and growth of the companies.

Scope of the Study and Research Methodology

The study pertains to non - financial operating central PSUs which are listed on the stock exchange and have undergone disinvestment process during the time period from 1991 - 2015. The sample consists of 37 PSUs under the category classification of Maharatana (7 nos.), Navratna (13 nos.), and Miniratna (17 nos.). The sample consists of 25 companies belonging to the manufacturing sector and 12 companies belonging to the service sector. Further, the PSUs under study have gone through disinvestment less than 50%, thereby fulfilling the criteria of government control and maintaining the status of PSUs. The sample is representative in nature as it adequately represents all the sectors of the industry where disinvestment has taken place. For the purpose of the study, the financial performance of these PSUs has been categorized into two phases as shown in the Table 1.

Although the process of disinvestment was introduced in 1991 - 1992 in a piecemeal manner, the disinvestment process until 1998 has been considered as an initial phase of disinvestment as an experiment to consider the impact of the policy over later years. Moreover, the initial process of disinvestment process was the sale of minority share in small lots and can be attributed to partial disinvestment strategy. The study, therefore, identifies two phases, Phase-I considering the impact of partial disinvestment process of starting years related to first generation pro-market reforms. The Phase-II is the study of impact of Phase-I disinvestment where there was only 52% realization against the targeted disinvestment. Further, Phase-II encompasses a larger volume of disinvestment and higher realization upto 70% as compared to Phase - I. Moreover, the disinvestment strategy shifted from partial to strategic disinvestment in Phase-II. Apart from this, the government accepted the recommendations of corporate governance practices initiated by SEBI in 2000 to improve the level of corporate governance. The time span of Phase-II also covers the subprime financial crisis in America and can be referred to as the recession phase as the disinvested PSUs operating in this phase had, in a way, suffered the impact of recession. It is expected/hypothesized that the financial performance of the disinvested PSUs would deteriorate in Phase-II over the period of time. Phase-II also witnessed the second generation reforms partially implemented and partially

Table 1. Phase - Wise Parameters of the Study

S. No.	Criteria	Phase - I	Phase - II
1	Year	1999-2007	2007-2015
2	Time Span	8	8
3	Targeted Investment (₹ in crores)	65500.00	150000.00
4	Actual Disinvestment Proceeds Realized (₹ in crores)	32619.03	103548.07
5	Percentage of Disinvestment	52%	70%

Source : Compiled from Department of Public Enterprises, Ministry of Heavy Industry and Public Enterprises, Government of India (2013)

under the quagmire of political consideration. Hence, it is hypothesized that profitability, operational efficiency, and solvency of disinvested PSUs have shown better financial performance in Phase-II as compared to Phase-I considering the high volume of disinvestment proceeds (70% realization) thereof.

Relevant data (secondary) concerning disinvested and non-disinvested PSUs were collected to assess primarily the 20 financial ratios pertaining to profitability, operating efficiency, leverage, and liquidity. The survey findings are primarily based on 37 PSUs as mentioned above. IBM SPSS Statistics Version 21 was used for all statistical analysis for this study.

Data Analysis and Results

The evaluation of financial performance of disinvested PSUs in Phase-I and Phase-II is based on the following major financial parameters :

(1) Profitability Ratio : Profitability has been assessed on the basis of two broad horizons of rate of return : first on the basis of investment and second on the basis of sale. The three returns on the basis of investment computed are : return on net worth (RONW), return on capital employed (ROCE), and return on total assets (ROTA). Returns on the basis of sales computed are : operating profit margin (OPM) and net profit margin (NPM).

(2) Efficiency Test : Operational and productive efficiency of resources/assets are assessed as the second variant of measuring the financial performance of sample manufacturing and service PSUs. The analysis is based on computation of all major turnover ratios (namely, TATOR, FATOR, and CATOR) as turnover is the primary mode to measure the extent of utilization of assets. Lower turnover ratios are indicative of underutilization of available resources and presence of idle capacity. FATOR and CATOR ratios would be indicative of the effectiveness in utilization of fixed assets and current assets, respectively. Further, debtor collection period (DCP), inventory holding period, and working capital holding period [days] (WCHP) have also been computed.

(3) Solvency and Liquidity Test : A comparison of capital structure practices and liquidity position has been made of various PSUs over a period of 16 years. Leverage ratio (debt/equity ratio) is taken for assessing the capital structure practices. Current ratio and acid test ratio have been chosen for measuring the liquidity position of the sampled PSUs.

(4) Coverage Ratio and Payout Ratio : A comparison of interest coverage ratio, financial charge coverage ratio, and dividend payout ratio has been made of various PSUs over a period of 16 years.

✤ **Hypothesis H1 :** Sustainability of PSUs is likely to be high post the disinvestment process.

It is evident from the Table 2 that out of total 18 financial variables, only three variables, namely ATR, ICR, and FCCR (post tax) have shown significant improvement in Phase-II as compared to Phase-I. Five variables, namely CR, WCHP, IHP, LR, DPR (cash profit) have shown improvement in Phase-II as compared to Phase-I, but the improvement is not significant at the 5% level of significance. On the other hand, six variables namely, NPM, OPM, ROCE, DCP, TATOR (times), and DPR (on NP) have shown deterioration in Phase-II as compared to Phase-I, but the deterioration is not significant at the 5% level of significance. The four variables namely, RONW, RA, FATR, and CATR have shown significant deterioration in Phase-II as compared to Phase-I.

It can be deduced from the Table 2 that hypothesis H1 is rejected on the basis of independent t-test considering

Table 2. Comparison of Financial Ratios of PSUs in Phase-I & Phase-II

	Key Ratios	Mean		*t*-value	Significance (2-tailed)	Remarks
		Phase-I	Phase-II			
Profitability Ratio	OPM (%)	23.70	19.64	1.609	0.109	Deterioration not significant
	NPM (%)	12.05	11.24	0.466	0.641	Deterioration not significant
	ROCE (%)	17.45	15.28	1.547	0.123	Deterioration not significant
	RONW(%)	14.41	11.17	2.207	0.028*	**Significant Deterioration**
	ROA(%)	21.46	15.95	3.162	0.002**	**Significant Deterioration**
Solvency & Liquidity	CR	1.43	1.54	-1.414	0.158	Improvement not significant
Ratio	ATR	1.30	1.50	-2.175	0.03*	**Significant Improvement**
	LR	0.89	0.72	1.336	0.183	Improvement not significant
Coverage Ratio	ICR	27.38	41.64	-1.866	0.05*	**Significant Improvement**
	FCCR Post Tax	16.99	34.28	-3.236	0.001**	**Significant Improvement**
Efficiency Ratio	FATOR	3.05	2.09	3.733	0.000**	**Significant Deterioration**
	CATOR	3.91	3.20	2.703	0.007**	**Significant Deterioration**
	TATOR	1.63	1.49	0.809	0.419	Deterioration not significant
	WCHP	123.27	125.61	-0.102	0.919	Deterioration not significant
	IHP	51.65	47.17	0.872	0.384	Improvement not significant
	DCP	79.72	100.88	-1.478	0.14	Deterioration not significant
Payout Ratio	DPR Net Profit	27.55	26.05	0.708	0.479	Deterioration not significant
	DPR Cash Profit	16.80	17.18	-0.343	0.731	Improvement not significant

Note. * Significant at 0.05 level, ** Significant at 0.01 level.

Notes.

1. PSUs having negative net worth have been excluded and RONW has been based on net profit.
2. ROTA is based on earnings before interest and taxes (EBIT).
3. ROCE is based on operating profit which excluded non-operating incomes.
4. RONW plus/minus 80%, ROCE plus/minus 80%, ROTA plus/minus 80%, OPM plus/minus 95%, and NPM ±70% have been excluded.
5. TATOR 12 and above, CATOR 16 and above, FATOR 24 and above have been excluded.
6. IHP 365 and above, DCP 365 and above, & WCHP greater than 365, and less than -365 have been excluded.
7. TD/TE: Total debt/total equity is leverage ratio.
8. DER greater than 8, CR greater than 8, and ATR more than 6 have been excluded.

These points hold true for other tables further mentioned throughout this paper.

the profitability ratio, efficiency ratio, and solvency ratio. However, hypothesis H1 is accepted on the basis of coverage ratio & liquidity ratio.

✧ **Hypothesis H2 :** Sustainability of Maharatna category of PSUs is likely to be high post the disinvestment process.

The Table 3 shows that out of the total 18 financial variables, only four variables namely, LR, ICR, FCCR (post tax), and DPR (on cash profit) have shown significant improvement in Phase-II as compared to Phase-I. Eight variables namely NPM, RONW, ROA, CR, ATR, WCHP, DCP, DPR (on net profit) have shown improvement in

Table 3. Comparison of Ratios of Maharatna PSUs in Phase-I & Phase-II

	Key Ratios	Mean		*t*-value	Significance	Remarks
		Phase-I	Phase-II		(2-tailed)	
Profitability Ratio	OPM (%)	21.70	18.11	1.246	0.217	Deterioration not significant
	NPM (%)	11.47	11.73	-0.144	0.886	Improvement not significant
	ROCE (%)	20.11	20.95	-0.268	0.789	Deterioration not significant
	RONW(%)	16.15	16.85	-0.21	0.835	Improvement not significant
	ROA(%)	19.89	20.57	-0.222	0.825	Improvement not significant
Solvency & Liquidity Ratio	CR	1.40	1.44	-0.278	0.782	Improvement not significant
	ATR	1.21	1.22	-0.064	0.949	Improvement not significant
	LR	0.82	0.40	2.217	0.032*	**Significant Improvement**
Coverage Ratio	ICR	23.68	52.46	-1.946	0.056*	**Significant Improvement**
	FCCR Post Tax	9.80	33.36	-3.573	0.001**	**Significant Improvement**
Efficiency Ratio	FATOR	2.66	2.16	1.103	0.273	Deterioration not significant
	CATOR	4.29	3.94	0.567	0.573	Deterioration not significant
	TATOR	1.42	1.31	0.562	0.576	Deterioration not significant
	WCHP	88.59	86.93	0.099	0.922	Improvement not significant
	IHP	50.94	54.46	-0.409	0.684	Deterioration not significant
	DCP	71.91	70.11	0.091	0.927	Improvement not significant
Payout Ratio	DPR Net Profit	24.52	28.71	-1.829	0.072	Improvement not significant
	DPR Cash Profit	17.32	21.90	-2.525	0.014*	**Significant Improvement**

Note. * Significant at 0.05 level, ** Significant at 0.01 level.

Table 4. Comparison of Ratios of Navratna PSUs in Phase-I & Phase-II

	Key Ratios	Mean		*t*-value	Significance	Remarks
		Phase-I	Phase-II		(2-tailed)	
Profitability Ratio	OPM (%)	32.36	25.97	1.828	0.07	Deterioration not significant
	NPM (%)	18.13	16.00	0.951	0.344	Deterioration not significant
	ROCE (%)	21.72	12.83	4.565	0.000**	**Significant Deterioration**
	RONW (%)	17.41	10.98	5.12	0.000**	**Significant Deterioration**
	ROA (%)	26.62	17.51	2.641	0.01**	**Significant Deterioration**
Solvency & Liquidity Ratio	CR	1.49	1.83	-2.173	0.032*	**Significant Improvement**
	ATR	1.27	1.79	-3.169	0.002**	**Significant Improvement**
	LR	0.43	0.80	-2.937	0.004**	**Significant Deterioration**
Coverage Ratio	ICR	50.08	65.57	-0.822	0.413	Improvement not significant
	FCCR Post Tax	31.69	48.42	-1.349	0.18	Improvement not significant
Efficiency Ratio	FATOR	2.99	1.60	2.787	0.006**	**Significant Deterioration**
	CATOR	4.56	3.80	1.431	0.155	Deterioration not significant
	TATOR	1.65	1.24	1.254	0.213	Deterioration not significant
	WCHP	114.00	191.00	-2.643	0.009**	**Significant Deterioration**
	IHP	43.13	29.63	1.819	0.072	Improvement not significant
	DCP	68.77	54.79	1.128	0.262	Improvement not significant
Payout Ratio	DPR Net Profit	29.53	28.66	0.349	0.728	Deterioration not significant
	DPR Cash Profit	19.54	18.04	0.919	0.36	Deterioration not significant

Note. * Significant at 0.05 level, ** Significant at 0.01 level.

Phase-II as compared to Phase-I, but the improvement is not significant at the 5% level of significance. On the other hand, six variables namely, OPM, ROCE, FATOR, CATOR, TATOR, and IHP have shown deterioration in Phase-II as compared to Phase-I, but the deterioration is not significant at the 5% level of significance.

It can be deduced from the Table 3 that hypothesis H2 is rejected on the basis of independent t-test considering the profitability ratio, efficiency ratio, and solvency ratio. Hypothesis H2 is accepted on the basis of coverage ratio.

↳ **Hypothesis H3 :** Sustainability of Navratna category of PSUs is likely to be high post the disinvestment process.

The Table 4 shows that out of total 18 financial variables, only two variables namely, CR and ATR have shown significant improvement in Phase-II as compared to Phase-I. Four variables namely, ICR, FCCR (post tax), IHP, and DCP have shown improvement in Phase-II as compared to Phase-I, but the improvement is not significant at the 5% level of significance.

On the other hand, six variables namely, OPM, NPM, CATOR, TATOR, DPR (net profit), and DPR (cash profit) have shown deterioration in Phase-II as compared to Phase-I, but the deterioration is not significant at the 5% level of significance. Six variables namely, ROCE, RONW, ROA, LR, FATOR, and WCHP have shown significant deterioration in Phase-II as compared to Phase-I.

It can be inferred from the Table 4 that hypothesis H3 is rejected on the basis of independent t-test considering the profitability ratios, efficiency ratio, liquidity ratio, and coverage ratio. Hypothesis H3 is though accepted on the basis of only the solvency ratio. It can also be deduced from the discussion on hypothesis H3 that, in fact, the performance of PSUs on the profitability parameter of Navratna PSUs has deteriorated significantly in Phase-II as compared to Phase-I.

↳ **Hypothesis H4 :** Sustainability of Miniratna category of PSUs is likely to be high post the disinvestment process.

It is evident from the Table 5 that out of total 18 financial variables, only three variables namely, LR, ICR, and FCCR (post tax) have shown significant improvement in Phase - II as compared to Phase - I. Seven variables namely, NPM, ROCE, CR, ATR, WCHP, IHP, and DPR (cash profit) have shown improvement in Phase-II as compared to Phase-I, but the improvement is not significant at the 5% level of significance. On the other hand, six variables namely, OPM, RONW, ROA, TATOR, DCP, and DPR (net profit) have shown deterioration in Phase-II as compared to Phase-I, but the deterioration is not significant at the 5% level of significance. Two variables namely, FATOR and CATOR have shown significant deterioration in Phase-II as compared to Phase-I.

It can be deduced from the Table 5 that hypothesis H4 is rejected on the basis of independent t-test considering the profitability ratio, efficiency ratio, and liquidity ratio. Hypothesis H4 is accepted on the basis of solvency ratio and coverage ratio. It can also be deduced from the analysis that, in fact, the performance of PSUs on efficiency parameters of Miniratna PSUs has deteriorated significantly in Phase-II as compared to Phase-I.

↳ **Hypothesis H5 :** Sustainability of manufacturing sector PSUs is likely to be high post the disinvestment process.

It is evident from the Table 6 that out of total 18 financial variables, only one variable : FCCR (post tax) has shown significant improvement in Phase-II as compared to Phase-I. Six variables namely, NPM, CR, ATR, LR, ICR, and IHP have shown improvement in Phase-II as compared to Phase-I, but the improvement is not significant

Table 5. Comparison of Ratios of Miniratna PSUs in Phase-I & Phase-II

	Key Ratios	Mean		t-value	Significance	Remarks
		Phase-I	Phase-II		(2-tailed)	
Profitability Ratio	OPM (%)	17.08	16.67	0.091	0.927	Deterioration not significant
	NPM(%)	6.99	8.37	-0.441	0.66	Improvement not significant
	ROCE(%)	12.29	14.41	-0.985	0.326	Improvement not significant
	RONW(%)	10.85	8.99	0.742	0.459	Deterioration not significant
	ROA (%)	17.73	13.23	1.864	0.064	Deterioration not significant
Solvency & Liquidity	CR	1.39	1.42	-0.277	0.782	Improvement not significant
Ratio	ATR	1.39	1.46	-0.48	0.632	Improvement not significant
	LR	1.34	0.79	2.147	0.034*	**Significant Improvement**
Coverage Ratio	ICR	9.24	23.80	-2.439	0.017*	**Significant Improvement**
	FCCR Post Tax	7.76	26.66	-2.93	0.004**	**Significant Improvement**
Efficiency Ratio	FATOR	3.32	2.34	2.786	0.006**	**Significant Deterioration**
	CATOR	3.14	2.57	1.925	0.056*	**Significant Deterioration**
	TATOR	1.73	1.71	0.088	0.93	Deterioration not significant
	WCHP	149.61	104.21	1.023	0.308	Improvement not significant
	IHP	59.56	54.15	0.622	0.535	Improvement not significant
	DCP	93.51	139.22	-1.692	0.093	Deterioration not significant
Payout Ratio	DPR Net Profit	27.40	23.52	0.946	0.346	Deterioration not significant
	DPR Cash Profit	14.10	14.80	-0.38	0.704	Improvement not significant

Note. * Significant at 0.05 level, ** Significant at 0.01 level.

Table 6. Comparison of Ratios of Manufacturing Sector PSUs in Phase-I & Phase-II

	Key Ratios	Mean		t-value	Significance	Remarks
		Phase-I	Phase-II		(2-tailed)	
Profitability Ratio	OPM (%)	23.09	21.35	0.594	0.553	Deterioration not significant
	NPM (%)	11.74	13.31	-0.824	0.411	Improvement not significant
	ROCE (%)	18.99	14.31	3.256	0.001**	**Significant Deterioration**
	RONW (%)	14.45	10.64	2.17	0.031*	**Significant Deterioration**
	ROA(%)	18.04	13.81	2.637	0.009**	**Significant Deterioration**
Solvency & Liquidity	CR	1.36	1.43	-0.896	0.371	Improvement not significant
Ratio	ATR	1.22	1.39	-1.69	0.092	Improvement not significant
	LR	0.92	0.70	1.439	0.151	Improvement not significant
Coverage Ratio	ICR	28.27	37.01	-1.037	0.301	Improvement not significant
	FCCR Post Tax	17.63	31.77	-2.302	0.022*	**Significant Improvement**
Efficiency Ratio	FATOR	3.25	2.24	3.493	0.001**	**Significant Deterioration**
	CATOR	4.06	3.43	1.986	0.048*	**Significant Deterioration**
	TATOR	1.76	1.68	0.397	0.692	Deterioration not significant
	WCHP	118.99	152.37	-1.389	0.166	Deterioration not significant
	IHP	58.22	54.00	0.676	0.5	Improvement not significant
	DCP	70.98	74.40	-0.36	0.719	Deterioration not significant
Payout Ratio	DPR Net Profit	29.45	26.58	1.152	0.25	Deterioration not significant
	DPR Cash Profit	17.93	17.58	0.281	0.779	Deterioration not significant

Note. * Significant at 0.05 level, ** Significant at 0.01 level.

at the 5% level of significance. On the other hand, six variables namely, OPM, TATR, WCHP, DCP, DPR (on net profit), and DPR (on cash profit) have shown deterioration in Phase-II as compared to Phase-I, but the deterioration is not significant at the 5% level of significance. Five variables namely, ROCE, RONW, ROA, FATOR, and CATOR have shown significant deterioration in Phase-II as compared to Phase-I.

It can be deduced from the Table 6 that hypothesis H5 is completely rejected on the basis of independent *t* - test considering all key financial ratios namely, profitability ratio, efficiency ratio, liquidity ratio, solvency ratio, and coverage ratio. It can also be deduced from the analysis that, in fact, the performance of manufacturing sector PSUs on efficiency parameters has deteriorated significantly in Phase-II as compared to Phase-I.

↳ **Hypothesis H6 :** Sustainability of service sector PSUs is likely to be high post the   disinvestment process.

It is evident from the Table 7 that out of total 18 financial variables, only one variable namely, FCCR (post tax) has shown significant improvement in Phase-II as compared to Phase-I. Nine variables namely, ROCE, CR, ATR, LR, ICR, WCHP, IHP, DPR (on net profit), and DPR (on cash profit) have shown improvement in Phase-II as compared to Phase-I, but the improvement is not significant at the 5% level of significance. On the other hand, five variables namely, RONW, ROCE, FATOR, TATOR, and DCP have shown deterioration in Phase-II as compared to Phase-I, but the deterioration is not significant at the 5% level of significance. Three variables namely, NPM, OPM, and CATOR have shown significant deterioration in Phase-II as compared to Phase-I.

It can be deduced from the Table 7 that hypothesis H6 is completely rejected on the basis of independent *t*-test considering the entire key financial ratios namely, profitability ratios, efficiency ratio, liquidity ratio, solvency ratio, and coverage ratio. It can also be deduced from the analysis that, in fact, the performance of PSUs on the parameters of profit margin of service sector PSUs has deteriorated significantly in Phase - II as compared to Phase-I.

Table 7. Comparison of Ratios of Service Sector PSUs in Phase-I & Phase-II

	Key Ratios	Mean		*t*- value	Significance (2-tailed)	Remarks
		Phase-I	Phase-II			
Profitability Ratio	OPM (%)	25.46	13.83	2.334	0.022*	**Significant Deterioration**
	NPM(%)	12.98	4.23	2.222	0.029*	**Significant Deterioration**
	ROCE (%)	12.96	18.59	-1.596	0.114	Improvement not significant
	RONW (%)	14.30	12.96	0.578	0.565	Deterioration not significant
	ROA(%)	31.43	23.22	1.78	0.079	Deterioration not significant
Solvency & Liquidity Ratio	CR	1.63	1.92	-1.401	0.165	Improvement not significant
	ATR	1.55	1.89	-1.728	0.088	Improvement not significant
	LR	0.82	0.78	0.16	0.873	Improvement not significant
Coverage Ratio	ICR	24.76	57.38	-1.847	0.068	Improvement not significant
	FCCR Post Tax	15.13	42.79	-2.369	0.02*	**Significant Improvement**
Efficiency Ratio	FATOR	2.49	1.59	1.737	0.086	Deterioration not significant
	CATOR	3.47	2.45	2.698	0.008**	**Significant Deterioration**
	TATOR	1.27	0.85	1.167	0.246	Deterioration not significant
	WCHP	135.73	34.78	1.765	0.081	Improvement not significant
	IHP	32.49	23.98	1.247	0.216	Improvement not significant
	DCP	105.21	190.76	-1.736	0.086	Deterioration not significant
Payout Ratio	DPR Net Profit	22.00	24.26	-0.653	0.516	Improvement not significant
	DPR Cash Profit	13.49	15.80	-0.978	0.331	Improvement not significant

Note. * Significant at 0.05 level, ** Significant at 0.01 level.

Table 8. Comparison of Ratios of Manufacturing & Service Sector PSUs in Phase-I & Phase-II Combined

	Key Ratios	Mean		*t*-value	Significance (2-tailed)	Remarks
		Manufacturing	Service			
Profitability Ratio	OPM (%)	22.25	20.32	0.655	0.513	Not significantly different
	NPM (%)	12.49	9.11	1.675	0.095	Not significantly different
	ROCE (%)	16.75	15.45	0.792	0.429	Not significantly different
	RONW(%)	12.62	13.71	-0.627	0.531	Not significantly different
	ROA (%)	16.01	27.80	-6.014	0.000**	**Significantly different**
Solvency & Liquidity	CR	1.39	1.76	-4.005	0.000**	**Significantly different**
Ratio	ATR	1.30	1.70	-3.805	0.000**	**Significantly different**
	LR	0.81	0.80	0.061	0.951	Not significantly different
Coverage Ratio	ICR	32.46	39.17	-0.75	0.454	Not significantly different
	FCCR Post Tax	24.41	27.35	-0.466	0.642	Not significantly different
Efficiency Ratio	FATOR	2.76	2.10	2.194	0.029*	**Significantly different**
	CATOR	3.76	3.02	2.43	0.016*	**Significantly different**
	TATOR	1.72	1.08	3.161	0.002**	**Significantly different**
	WCHP	135.00	91.13	1.636	0.103	Not significantly different
	IHP	56.19	28.73	4.723	0.000**	**Significantly different**
	DCP	72.62	143.01	-4.317	0.000**	**Significantly different**
Payout Ratio	DPR Net Profit	28.08	23.00	2.069	0.039*	**Significantly different**
	DPR Cash Profit	17.76	14.51	2.542	0.011**	**Significantly different**

Note. * Significant at 0.05 level, ** Significant at 0.01 level.

↳ **Hypothesis H7 :** Sustainability of manufacturing & service sectors' PSUs is likely to be the same post the disinvestment process.

Table 9. Summary of Hypotheses Used in the Study and Their Results

Hypothesis No.	Hypothesis Description	Hypothesis Accepted Based On	Hypothesis Rejected Based on
H1	Sustainability of PSUs is likely to be high post the disinvestment process.	Coverage ratio & liquidity ratio	Profitability ratio, efficiency ratio, and solvency ratio
H2	Sustainability of Maharatna category of PSUs is likely to be high post the disinvestment process.	Coverage ratio	Profitability ratio, efficiency ratio, and solvency ratio
H3	Sustainability of Navratna category of PSUs is likely to be high post the disinvestment process.	Solvency ratio	Profitability ratio, efficiency ratio, liquidity ratio, and coverage ratio
H4	Sustainability of Miniratna category of PSUs is likely to be high post the disinvestment process.	Solvency ratio and coverage ratio	Profitability ratio, efficiency ratio, and liquidity ratio
H5	Sustainability of manufacturing sector PSUs is likely to be high post the disinvestment process.		Profitability ratio, efficiency ratio, liquidity ratio, solvency ratio, and coverage ratio
H6	Sustainability of service sector PSUs is likely to be high post the disinvestment process.		Profitability ratio, efficiency ratio, liquidity ratio, solvency ratio, and coverage ratio
H7	Sustainability of manufacturing & service sectors' PSUs is likely to be the same post the disinvestment process.	Accepted, in general	

It is evident from the Table 8 that out of total 18 financial variables, 10 variables namely ROA, CR, ATR, FATOR, CATOR, TATOR, IHP, DCP, DPR (net profit), and DPR (cash profit) are significantly different for manufacturing and service sector PSUs. Eight variables namely, OPM, NPM, ROCE, RONW, LR, ICR, FCCR, and WCHP are not significantly different for both manufacturing and service sector PSUs. Thus, Table 8 suggests that hypothesis H7 is acceptable in general.

The Table 9 shows a summarized list of all the hypotheses used in this study and their results showing their basis of acceptance and rejection.

Discussion

This section summarizes the results of independent t - test of all the aspects dealt in this study. The Table 10 presents the summary of the results. The salient features of the results are as follows:

(1) Service sector PSUs are observed to have significantly better performance compared to manufacturing sector PSUs mainly in terms of ROA, LR (both CR as well as ATR), and IHP.

(2) Manufacturing sector PSUs have performed significantly better in terms of efficiency ratio (FATOR and

Table 10. Summarized *p* - values of Comparative Analysis of PSUs in Phase-I & Phase-II Combined

Key Financial Ratios	All Listed PSUs	Maharatna PSUs	Navratna PSUs	Miniratna PSUs	Manufacturing Sector PSUs	Service Sector PSUs	Comparative Performance of Manufacturing & Service Sectors
OPM	0.109	0.217	0.07	0.927	0.553	**0.022***	0.513
NPM	0.641	0.886	0.344	0.66	0.411	**0.029***	0.095
ROCE	0.123	0.789	**0.000****	0.326	**0.001****	0.114	0.429
RONW	**0.028***	0.835	**0.000****	0.459	**0.031***	0.565	0.531
ROA	**0.002****	0.825	**0.01****	0.064	**0.009****	0.079	**0.000****
CR	0.158	0.782	**0.032***	0.782	0.371	0.165	**0.000****
ATR	**0.03***	0.949	**0.002****	0.632	0.092	0.088	**0.000****
DER	0.183	**0.032***	**0.004****	**0.034***	0.151	0.873	0.951
ICR	**0.05***	**0.05***	0.413	**0.017***	0.301	0.068	0.454
FCCR	**0.001****	**0.001****	0.18	**0.004****	**0.022***	**0.02***	0.642
FATOR	**0.000****	0.273	**0.006****	**0.006****	**0.001****	0.086	**0.029***
CATOR	**0.007****	0.573	0.155	**0.056***	**0.048***	**0.008****	**0.016***
TATOR	0.419	0.576	0.213	0.93	0.692	0.246	**0.002****
WCHP	0.919	0.922	**0.009****	0.308	0.166	0.081	0.103
IHP	0.384	0.684	0.072	0.535	0.5	0.216	**0.000****
DCP	0.14	0.927	0.262	0.093	0.719	0.086	**0.000****
DRP(Net Profit)	0.479	0.072	0.728	0.346	0.25	0.516	**0.039***
DPR(Cash Profit)	0.731	**0.014***	0.36	0.704	0.779	0.331	**0.011****

Note : * Significant at 0.05 level, ** Significant at 0.01 level.

CATOR), DCP, and DPR ; whereas, the performance of both manufacturing and service sector PSUs are not significantly different in terms of profitability ratio (namely OPM, NPM, ROCE, RONW), solvency ratio (DER), coverage ratio (ICR and DSCR), and WCHP.

(3) The performance of Maharatna PSUs has not shown significant improvement in Phase-II as compared to Phase-I except in terms of solvency & coverage ratios ; whereas, the performance of Maharatna PSUs in Phase-II has shown significant improvement over Phase-I.

(4) There is significant deterioration in the performance of Navratna PSUs in Phase-II as compared to Phase-I on the financial parameters of profitability ratio (ROCE, RONW, and ROA), solvency ratio, FATOR, and WCHP. On the other hand, liquidity ratio has improved significantly in Phase-II as compared to Phase-I ; whereas, the performance of Navratna PSUs on profit margin, coverage ratio, IHP, DCP, and on dividend payout is not significantly different in Phase-II as compared to Phase-I.

(5) Performance of Miniratna PSUs has not shown significant improvement in Phase-II as compared to Phase-I on the financial parameters of profitability ratio, liquidity ratio, dividend payout ratio, inventory, and receivables management. The performance of Miniratna PSUs deteriorated significantly on the efficient utilization of fixed & current assets ; whereas, the performance of Miniratna PSUs improved significantly on the liquidity ratio and solvency ratio fronts.

(6) The performance of manufacturing sector PSUs deteriorated significantly on the profitability front (namely ROCE, RONW, and ROA) and on the efficient utilization of fixed and current assets ; whereas, the performance of service sectors deteriorated significantly on the profit margin fronts.

(7) When the performance of PSUs as a whole without categorization is considered, it is found that performance of PSUs in Phase-II is not significantly different on most of the financial parameters. Only on the coverage ratio front the performance of PSUs is significantly better in Phase-II as compared to Phase-I.

(8) Broadly, significant differences (improvement) have been observed mainly on the coverage ratio front and no significant differences have been observed on the front of dividend payout, while results have been mixed on the other financial parameters.

Research Implications

Considering the above empirical results, PSUs were able to sustain the global shocks and recession after pro-market reforms.

(1) The findings of the analysis imply that the disinvestment policy focused more on meeting the fiscal deficit with a targeted amount declared in the budget, which was quite erratic due to changing market dynamics in the both phases. However, the performance of PSUs in Phase-II declined as compared to Phase-I due to global shocks as mentioned above.

(2) DPR significantly improved in case of Maharatna PSUs, where the disinvestment was more as compared to Navratna and Miniratna PSUs in Phase-II. This implies that the increase in DPR nullifies the equity dilution of Maharatna PSUs.

(3) The other PSUs show increase in the dividend payout ratio, but the increase is not significant. Somehow, the financial performance of PSUs is not misdirected, which signifies the internal operational efficiency and professionalism adopted by the management(s) of the PSUs.

(4) The challenges of self-sustainability improved with the post disinvestment policies as the PSUs understood that the non-financial factors of sustainability are equivalently prudent contravening the perception that disinvestment is the only panacea for sustainability of PSUs.

(5) The whole process of disinvestment should not to be used a tool to reduce the fiscal deficit only.

(6) The results of the study show that PSUs can survive in this competitive market.

Limitations of the Study

(1) The model suggested is based on the selected PSUs. Therefore, the model is suggestive and can be considered while formulating policies for disinvestment and strategic sales.

(2) The sample is confined to Maharatna, Navratna, and Miniratna PSUs, and the conclusions are drawn on the basis of the data available for these companies.

(3) To understand the broader domain of the study, we were faced with limitations in extracting the financial data of PSUs for better comparison.

Scope for Further Research

(1) The total number of PSUs operating in India is 290 (PSU Survey 2013-14) which includes 7 Maharatnas, 17 Navratnas, and 54 Miniratnas under category-I and 18 Miniratnas under category-II. The paper attempts to analyze the financial performance of 37 PSUs. The sample size may be sparse considering the total number of companies falling under each category and may be representative in nature considering the limitation of availability of data. Probably, a future similar research with more number of cases could be done for better findings.

(2) More ratios can be studied and compared for even better analysis of selected PSUs undertaken for the study from different sets of secondary data sources.

(3) Category-specific study based on divested PSUs can be explored.

(4) Similar studies can be done for analyzing the impact of MoUs undertaken by the PSUs.

(5) The study made a modest empirical attempt to identify the impact on sustainability of PSUs post disinvestment. However, a perception based analysis based on the responses of different stakeholders of PSUs could also be done.

(6) A cross-country comparison with BRICS and G-8 nations can be conducted for an elaborate analysis and understating of the success and failure criteria of privatization and disinvestment approach.

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Appendix

Appendix. Acronyms and Definitions

Abbreviation	Description	Formula (Wherever Applicable)
PSU	Public sector undertaking	
MOU	Memorandum of undertaking	
IPO	Initial public offer	
OPM	Operating profit margin	Operating Profit / Net Sales × 100
NPM	Net profit margin	Profit after tax / Revenue × 100
ROCE	Return on capital employee	Operating Profit / Capital employed × 100
RONW	Return on net worth	Net Income / Shareholders' Equity × 100
ROA	Return on assets	Net Income / Average Total Asset × 100
CR	Current ratio	Current Asset / Current Liability
ATR	Acid test ratio	(Current Assets - Inventory) / Current Liability
LR	Leverage ratio	LR is used to determine the relative level of debt load that a business has incurred. It comprises of debt ratio and debt equity ratio.
DER	Debt equity ratio	Total Liability / Total Asset
EBIT	Earnings before interest and taxes	
FCBT	Fixed charges before tax	
ICR	Interest coverage ratio	EBIT / Interest Expenses
FCCR	Fixed charges coverage ratio post tax	(EBIT + FCBT) / (FCBT+ Interest)
FATOR	Fixed asset turnover ratio	Net Sales / (Fixed Asset - Accumulated Depreciation)
CATOR	Current assets turnover ratio	Net Sales / Average Current Assets
TATOR	Total assets turnover ratio	Net Sales / Total (Or Net) Assets
WCHP	Working capital holding period	Average Working Capital / Net Sales × 365 days
IHP	Inventory holding period	Cost of Sales / Average Inventory × 365 days
DCP	Debtor collection period	Debtors / Net Sales × 365 days
DPR (Net Profit)	Dividend payout ratio (net profit)	Dividend per share / Earning per share
DPR (Cash Profit)	Dividend payout ratio (cash profit)	Common Stock Dividends / (Cash Flow from Operations - Capital Expenditures - Preferred Dividend Paid)

About the Authors

Rakhi Singh is a commerce graduate and has completed her MBA in finance from Birla Institute of Technology Mesra. She has previously worked as an Assistant Manager in private sector banks where she worked in forex and portfolio management.

Vijay Agrawal has a total experience of 23 years, including an industrial experience of 7 years along with teaching/research experience of 16 years. He graduated in science from Allahabad University, and completed his management degree in finance from Lucknow University and was awarded Ph.D. in management from Birla Institute of Technology. Under his supervision, two scholars have been awarded doctorate degrees so far.