An Exploratory Study on the Performance of Solar Company in India

ISBN: 978-1-943295-08-1

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Government of India is supporting solar energy using both regulatory and economic contrivance However performance of majority firms in the sector is deteriorating Such a situation does not augur well for industry The research is qualitative and exploratory based on the registered solar companies data available through reportjunction.com and Prowess IQ v1.81 along with information available in annual reports of the companies journals and newspapers The variables return on asset, current ratio, debt-equity ratio and asset turnover ratio and Porter's five force model are used to access the profitability of solar industries. The study provides a glimpse of competitiveness in the already stagnated market of solar energy.

Keywords: Indian Solar Firms, Return on Assets, Porter's Five Forces, and Solar Industry Capacity Utilisation.

1. Introduction

India being a tropical country and thus is endowed with abundant solar energy. More than 58 percent of the country's land area has vast potential for solar energy as the country receives a daily solar irradiance of 4-7 Kilowatt hour (KWh) per square meter per day sunshine of about 6-8 hours a day-and thus an average approximately 2300-3200 hours per year (Raghavan & Subramanya, 2010; Sharma, Tiwari, & Sood, 2012). While Rajasthan, northern Gujarat and parts of Ladakh in the Northern India receives the highest annual global irradiance (5.5-7 KWh/m^2/day), the North-Eastern states receive the lowest (3-4.5 KWh/m^2/day). As per the Central Statistical Organization (CSO, 2017) report, the potential of renewables in India include - solar energy (62.48 percent) followed by the wind (33.78 percent), small-hydro power (1.65%) and biomass, waste to energy & bagasse-based power (2.09%).Eight out of twelve states (2 percent and above national average solar power potential) having more than 80 percent potential in the form of solar energy. The geographical distribution of the estimated potential of renewable power as on 31 March, 2017 reveals that Rajasthan has the highest share of about 14%, followed by Gujarat with 13% share and Maharashtra with 10% share, mainly on account of solar power potential. Solar energy is significantly important for India in achieving its social, political and environmental goals of sustainable development and can serve in realising energy security and primary source of cheap and plentiful sustainable energy (Yenneti, 2016). Increasing reliance on solar power could boost the country's energy security, lessen its massive reliance on coal and can help thousands of Indian homes to gain a reliable and continuous supply of electricity (Dutta & Roy, 2014). The Government of Inda (GoI) through Ministry of New and Renewable Energy (MNRE) has envisaged an enabling and attractive environment for investors and consumers through both regulatory and incentive mechanism such as feed-in-tariff, solar metering policy, renewable purchase obligation, viability gap funding (for solar projects), and subsidies (30-60 percent). With an aim to fast-track promotion of solar energy, the 20 Gigawatt (GW) target set under Jawaharlal Nehru National Solar Mission (JNNSM) for 2022 has been raised to 100GW (NITI Ayog, 2015). All these policy initiatives are intended to provide a push for investment and enhance the financial viability of solar energy sector in the country. The study, therefore, tries to analyse the financial performance of the solar energy firms using four financial ratios-return on asset (ROA), debt-equity ratio (D/E ratio), current ratio (CR) and asset turnover ratio (ATR) and Porter's Five Forces to access overall attractiveness of solar energy sector.

2. Literature Review

There are no empirical studies on the financial performance of solar energy companies in India. Most of the literature on solar firms are focused on technical, regulatory aspects at the country level, primarily as market potential studies. Kaundinya et al. (2009) and Prasanna et al. (2014) study financial viability and feasibility of the post-installation and cost-benefit assessment of the solar energy projects undertaken under the various programs. However, studies on solar energy explicitly focusing on the technical development of products and market-related factors have primarily ignored the firm's profitability which may play a more significant role enhancing active participation in solar energy.

Accounting ratios are an essential tool used for studying the firms' performance using financial statements. Ratio analysis helps and provides a more in-depth analysis of the profitability, liquidity, solvency and activity levels taking going on in within the organisation (NCERT, 2012). It is also to identify the problem area as well as the secure parts of the business and to compare the risk and return relationships of firms of different sizes (Khan & Jain, 2015).

There are four primary types of financial ratios as per the functional classification. They are as follows: Liquidity ratios (liquidity ratios are considered to compute the firm's capability to meet its current debts), Solvency ratios (solvency ratios are calculated to conclude the ability of the business to service its debt in the long run), activity or turnover ratios (activity ratios indicates the speed and efficiency at which, actions of the industry are being performed by the firms) and profitability ratios

(profitability ratios are to analyse the financial soundness of the firms which as a result determine the performance of the managers as well as the earning capacity of the industry) (NCERT, 2012). To estimate the financial performance of the registered solar firms in India four ratios one from each type of classification used for the study: current ratio (liquidity ratio), Debt-equity ratio (solvency ratio), Asset turnover ratio (activity or turnover ratio) and Return on assets (Profitability ratio).

The company's assets include both debt and equity. A combination of both is used to fund the operations of the company (Titko, Skvarciany, & Jurevičienė, 2015). Both return on assets (ROA) and return on equity (ROE) are robust (Albulescu, 2005), and the most frequent method used in for measuring the profitability and the performance of the firms. Jo et al. (2015) used ROA and profit before tax as proxies of firm performance while Hagel et al., (2010) uses ROA to measure long-term profitability trends. ROA widely used as it measures firm efficiency in producing profits. ROA ratio is calculated between net income and total net assets (Hagel et al., 2010). ROA avoids the potential distortions created by financial strategies, and it is a better standard of financial performance than income statement measures like return on sales. While analysing firm performance, ROA is the preferred ratio (Hutchinson & Gul, 2004; Mashayekhi & Bazazb, 2008; Nuryanah & Islam, 2011; Al-Matari et al., 2014) and it is considered one of the most relevant accounting measures (Aliabadi et al., 2013). In fact, ROA is a superior criteria of financial performance, as it shows how productive the firm's total assets are in producing profits (Hagel III et al., 2010; Masa'deh et al., 2015). A strong ROE is a clear signal that manager are minting money for the shareholders, but if ROA is low, it means that company is holding a lot of debt. Hence, in this case, a higher ROE can give the investor a false impression about the company's fortunes. The ROA ratio provides investors with an idea of how effective the company is converting the assets it has to earn net income (Veltri, & Mazzotta, 2016). One thing to be kept in mind while using ROA is that it must be compared against company's previous ROA or the ROA of a similar company (Azeez, 2015; Herciu & Şerban, 2016).

ROA, profit after tax (PAT) and ROE also increase the importance of net income in analysing firm performance. ATR provides the proficiency at which firm is managing its resources to generate sales. It is an indicator of the efficiency with which a company is deploying its assets to produce the revenue (The Economic Times, 2017). ROA calculated by dividing net sales by average total assets. A higher ATR is desired describing a better state of affairs at the company. This ratio gives understanding to the stakeholders into the internal management of the company. ATR is used to measures performance of the firm (Delen, Kuzey, & Uyar, 2013).In India, solar company differs regarding sizes. To prevent bias regarding firm sizes, ROA and ATR are used for the financial performance analysis.

Debt-equity ratio is one of the most commonly used measures to test the solvency of an enterprise. This ratio establishes a relationship between long-term debts and shareholders' funds (Khan & Jain, 2015). Debts include any long-term obligation in the form of debentures, bonds, loans from financial institutions and any other type of long-term borrowings. Shareholders' funds include equity share capital +preference share capital + reserves and surplus-fictitious assets such as the debit balance of profit and loss account, discount on issue of shares and other items of losses (Shankaranarayana & Ramanath , 2014). Banks and stockholders are interested in a company's long-run solvency, particularly its ability to pay interest as it comes due and to report the face value of debt at maturity (Kimmel, Weygandt, & Kieso, 2015). It shows the riskiness or otherwise of a company is in term of its financial structure. The debt-equity ratio should be less than one to show that the owners' fund is greater than the lenders' funds. It is also considered a measure of debt exposure since it reveals the extent to which an enterprise has been financed by debts. In fact, it is considered unhealthy or risky to have debts more than shareholders' funds. As high debt will lead to more interest payments and less money to expand sales revenue. It will also affect cash flow for day-to-day operation. More the ratio significant is the share of the debt. But, if this ratio is negative than it is not advisable to invest in a company (Khan & Jain, 2015). Debt as a source of finance can be more expensive than equity finance because debt finance involves regular interest payments. A low ratio is preferred, but it varies from industry to industry (Khan & Jain, 2015). For example, capital-intensive sectors such as automobiles and manufacturing show higher debit-equity figures than others. A high debt-equity ratio may indicate strange leverage and hence, higher risk of credit default (Pandey, 1999). Anything lower than one means that there is a significantly larger equity base in comparison to the debt.

The current ratio is a measure of the degree to which current assets cover current liabilities. The additional current assets over current liabilities provide a measure of safety margin available against uncertainty in the realisation of existing assets and flow of funds (NCERT, 2012). The ratio should be reasonable. It should neither be very high or low. Both the situations have their inherent disadvantages. A very high current rate implies substantial investment in current assets which is not a good sign as it reflects underutilisation or improper utilisation of resources. A low ratio endangers the business and puts it at risk of facing a situation where it will not be able to pay its short-term debt on time. If this problem persists, it may affect firms' creditworthiness adversely. Usually, it is safe to have this ratio within the range of 2:1 (Khan & Jain, 2015).

Porter's five forces model is a usable industry assessment tool. This research along with financial facts utilises the "Five Forces" model to analyse the competitiveness of the solar power industry in India. The strength of each five forces is inversely proportional to the price and profits such that a weak competitive force may serve as an opportunity, while a strong one, may serve as a threat (Hill & Jones, 2007). There are five basic stakeholders as per Porter's model (current competitors, potential competitors, suppliers, buyers and substitutes) that can impact a particular industry profitability, performance and attractiveness in the market (Indiatsy et al., 2014). All these factors are also influencing the solar industry sector in India. The results provide a useful reference for the development of strategies for the solar industry and other renewable energy industries as well as related enterprises in India.

3. Context and Problem Statement

The genesis of the current study is based on media reports on declining financial performance of the solar energy firms in the country and apprehensions expressed by experts that such a situation may not be favourable for achieving the solar energy targets of 2022 (Anand, 2012; Raghunathan, 2017; Sasi, 2016; The Indian Express, 2017); Raghavan, 2017; Reuters, 2017).Thus the study provides a shred of evidence to such apprehensions and suggests possible policy correction measures. The Porter's Five Forces analysis is used to access the attractiveness of the solar energy sector.

4. Research Questions

There searchers have tried to study the performance of solar energy firms with following two hypotheses

1. Does the performance of the solar energy firms in India deteriorating?
2. What factors are responsible for the decline in performance of solar energy firms in India?

5. Methodology

The current research is exploratory in nature, since no empirical research exists which analysed the performance of the solar companies. The studies so far for the solar manufacturing industry are more focused on regulatory, and technological aspects, post-installation returns and to some extent on marketing aspects. The researcher collected and analysed data available for the registered solar companies through two data sources namely reportjunction.com and Prowess IQ v1.80. The researcher also examined qualitative data and information available in annual reports of the companies, relevant journals and newspaper articles. The trade data available on World Trade Organisation (WTO) on the website is included in the study to provide the import data of India solar photovoltaic (PV) cells. The study has used four financial ratios- return on assets (ROA), debt-equity ratio (D/E ratio), current ratio (CR) and asset turnover ratio (ATR) - to evaluate the financial performance of the firms. The solar companies operating in India can defined in two groups: first those directly importing solar panels and installing. These company can be operated from warehouse requiring minimal capital. Second groups are those companies that are importing the base raw materials (silicon wafers; which is generally imported from China) and do rest of the processing in India.

The Porter's five forces Model says that five stakeholders or forces in each industry have significant impact on the structure of the industry which in-turn determines the profitability, return and overall attractiveness of the given industry. These forces include – the threat of new entrants, the bargaining power of the suppliers, the bargaining power of the buyers, the threat from substitute products and the existing rivalry within the industry (Porter, 1980). The relative power and interplay of these "five forces" helps in understanding the competitive environment and of an industry and consequently offers useful inputs when determining development strategies for both the industry and individual firms in that industry.

6. Results and Discussions

The study found that the financial performance of the majority of the firms in the solar industry sector measuring through ROA is declining except for Vikram solar and Ujaas energy. Most of the companies show a declining trend over the years in their ROA and many of these are on the verge of bankruptcy (Table 1).The performance of Web sol energy system is exceptional in year 2017 (Further more in-depth analysis is required to understand the reason for it). The financial condition of both types of companies –those undertaking solar system installation projects and those into manufacturing of solar panels is deteriorating fast. However, the enterprises that are manufacturing other solar items like solar lamps, solar toys, solar calculators etc. as well as and those dealing with solar inverters, lighting, wiring and other electrical equipment's are performing better than those firms dealing only in solar panels. The ATR for such companies dealing in other solar products along with solar panels is better. The ATR shows that there is no shortage of demand for solar products in the market. And the overall asset requirement of the industry is minimum. Only those companies were having strong financial backing from parent companies like TATA, Adani etc. are surviving. TATA Power solar has more than doubled its revenue in two years but reported a consolidate loss of ≠247 crore in the 2016-17 financial year (Kondratieva, 2017).The D/E ratio of the solar firm performance further presents grim scenario (Table 1). Solar companies in India are not capital intensive in nature hence, it requires more equity than debt funding. Since company will require reserve for day-to-day activities. The debt source of funding drains out earning on regular basis. The CR also provides evidence towards the lack of assets with the company. All these factors negatively impact the shareholders and investors belief on the company's profitability and future return option.

The drastic fall in the solar energy tariff from ≠15 to ≠2.44 in 5 years through reverse bidding is a good indicator for government and customers (Jhunjhunwala & Ramamurthi, 2017; Raghunathan, 2017) but, it has impacted profitability of solar firms pushing many global and local companies on the edge of bankruptcy (Sasi, 2016) and some companies are knowingly doing it to finish competition in India market and grasp major share in 100GW targets. Term 'disruptive bidding' game is used to denote such low tariff quote for the solar energy sector (Sasi, 2016).

The cheap solar equipment (especially solar panels) imported from China and it lead to under capacity operation of solar firms in India is one of the main reason behind the loss-making of Indian manufacturers. Solar PV is almost 60-70 percent of total solar system costs (Razdan, 2016).At present, it is not possible for Indian solar companies to compete with Chinese giant regarding price, technology, and scale of operation. Despite India being in top ten countries regarding installed solar capacity, there is no manufacturing facility for silicon wafers (base material used in the manufacturing of solar panels and other electronic items) in the country, which is imported from global sources, with the bulk of it coming from China. The GoI has

made provision than subsidy will be provided for solar system installation only if it is made in India. Still, it is not working because the installer is complaining about the high price and low quality of solar panels manufactured in India. Moreover, some India companies are importing solar panel components in parts from China and assembling it in India and supplying in the market.

Table 1 *The Result of Four Ratio of the Registered Solar Companies in India*

Name of the Company	Items	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Web sol Energy System	ROA (%)	2.17	2.31	-0.62	0.29	-48.98	-2.99	-11.81	-8.91	-2.17	24.73
	CR	2.04	1.46	1.77	1.03	0.44	0.43	0.44	0.4	0.3	0.12
	D/E ratio	1.57	3.25	1.96	1.92	-4.65	-3.85	-2.41	-1.79	-1.57	2.09
	ATR (%)	239.78	333.90	322.48	367.08	333.89	464.34	206.68	165.13	163.69	108.70
Vikram Solar	ROA (%)	n/a	4.35	6.00	6.01	6.56	6.69	6.16	7.02	8.77	8.77
	CR	n/a	n/a	1.12	1.43	1.39	1.33	1.28	1.30	1.36	1.36
	D/E ratio	n/a	-	-	-	-	-	-	-	-	-
	ATR (%)	n/a	44.47	76.02	112.90	99.54	122.04	108.54	115.25	131.96	131.96
Ujaas Energy	ROA (%)	2.42	1.75	2.88	2.58	0.64	10.45	7.53	3.23	4.24	6.49
	CR	2.96	2.58	3.76	1.84	3.37	1.72	1.64	3.53	1.96	1.9
	D/E ratio	0.31	1.52	1.37	0.61	0.24	0.52	0.74	0.57	0.48	0.47
	ATR (%)	155.14	106.39	119.77	116.22	23.68	93.91	105.83	30.48	56.35	13.32
Surana Solar	ROA (%)	n/a	n/a	11.02	20.75	0.41	2.73	2.96	6.7	2.03	1.97
	CR	n/a	n/a	1.96	1.38	1.35	1.44	1.34	1.1	1.66	1.59
	D/E ratio	n/a	n/a	0.68	0.36	0.59	0.69	0.98	1.37	0.93	0.4
	ATR (%)	n/a	n/a	52.10	129.09	92.95	100.12	126.01	99.63	113.33	99.27
IND Renewable Energy Ltd	ROA (%)	n/a	n/a	n/a	n/a	0	0.56	-10.83	1.4	9.12	1.78
	CR	n/a	n/a	n/a	n/a	0	423.26	73.44	1082.22	5.47	7.08
	D/E ratio	n/a	n/a	n/a	n/a	0	3.27	0	0	0	1.2
	ATR (%)	n/a	n/a	n/a	n/a	0.00	3.26	0.00	0.00	0.00	1.11
Urja Global	ROA (%)	-3.23	0.93	0.87	1.08	0.61	0.61	0.68	0.13	0.81	0.65
	CR	97.77	8.64	13.74	0.81	1.25	2.52	2.76	0.65	2.54	1.31
	D/E ratio	0	0	0	0.05	0.02	0.01	0.01	0.02	0.003	0.01
	ATR (%)	1.08	16.38	109.94	181.04	90.10	92.17	92.84	84.19	93.47	74.77
XL energy	ROA (%)	7.18	5.59	-29.27	-10.44	-2.23	-1.1	-0.56	-0.28	-0.24	-0.21
	CR	2.2	1.37	0.79	1.18	0.76	0.52	0.52	0.5	0.28	0.27
	D/E ratio	0.42	1.32	34.47	-14.88	-8.78	-5.75	-5.38	-5.21	-9.95	-9.7
	ATR (%)	140.71	72.86	64.71	15.95	0.348	0.314	0.202	0.178	0.033	0.111
Gita Renewable energy	ROA (%)	n/a	n/a	n/a	-4.99	-3.54	-0.04	-0.47	-1.82	1.49	-2.22
	CR	n/a	n/a	n/a	89.02	21.92	2.73	4.62	4.76	0.57	0.57
	D/E ratio	n/a	n/a	n/a	0	0.02	0.02	2.11	2.02	0.04	0
	ATR (%)	n/a	n/a	n/a	n/a	0	0	0.06	0.05	0.04	0
Sun Source	ROA (%)	n/a	n/a	0.07	0.02	-0.1	-64.07	-2.36	-2.25	-4.82	-2.70
	CR	n/a	n/a	39.77	28.99	10.81	1.36	0.2	0.11	0.11	0.08
	D/E ratio	n/a	n/a	0	0	0	0.03	0.17	0.17	0.18	0.20
	ATR (%)	n/a	2.10	2.89	8.66	n/a	16.63	22.36	6.83	n/a	n/a
Indosolar	ROA (%)	-5.16	-1.75	-8.25	-5.73	-18.62	-10.84	-11.8	-6.94	-12.81	-5.18
	CR	0.03	0.76	0.72	0.81	0.74	0.51	0.14	0.11	0.06	0.06
	D/E ratio	0	-17.67	4.13	1.05	3.63	10.33	15.76	-6.43	-2.27	-0.18
	ATR (%)	0.00	0.00	13.99	58.01	7.49	4.65	1.33	25.95	23.35	39.41
Moser Baer	ROA (%)	-1.56	-3.21	-0.77	-9.35	-8.21	-12.59	-13.66	-27.22	-31.97	-87.99
	CR	1.59	1.15	1.33	0.9	0.59	0.78	0.57	0.4	0.29	0.14
	D/E ratio	1.33	1.39	1.29	1.4	1.45	5.03	-11.37	-1.82	-0.8	-0.26
	ATR (%)	37.73	48.77	48.35	43.71	52.18	39.42	29.43	28.77	27.16	42.32

Source: Primary Data Collected for the study. N/A—not available

Note: ROA=Return on Assets; CR= Current Ratio; D/E ratio= Debt-Equity Ratio and ATR= Asset turnover ratio

Table 2 *Import of Photovoltaic cells in India from 2007-2016*

Product HS Code: 854140 (Photovoltaic cells) $ Million										
Country/ Year	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
World	168.91	420.04	405.44	298.86	1332.84	871.94	1069.46	774.78	2056.74	3157.24
China	11.97 (7.1%)	23.98 (5.7%)	36.81 (9.1%)	83.47 (27.9%)	488.51 (36.7%)	341.71 (39.2%)	768.55 (71.9%)	514.87 (66.5%)	1607.93 (78.2%)	2666.33 (84.5%)
Malaysia	2.51 (1.5%)	2.64 (0.6%)	4.55 (1.1%)	30.65 (10.3%)	180.6 (13.5%)	99.69 (11.4%)	26.01 (2.4%)	68.18 (8.8%)	221.22 (10.8%)	244.56 (7.7%)
Japan	10.17 (6.0%)	33.04 (7.9%)	21.12 (5.2%)	9.11 (3.0%)	113.25 (8.5%)	43.73 (5.0%)	30.35 (2.8%)	19.8 (2.6%)	51.35 (2.5%)	69.34 (2.2%)

Source: Data Collected from WTC Web Site (International Trade Centre, 1999-2015). Bracket Values are Respective Shares in Percentage

The import of low-cost Chinese made solar panels is blocking the fixed assets available with the Indian manufacturer due not operating in full capacity. In 2015-16 Indian company produced solar modules of 1.33 GW out of the total capacity of 5.29 GW (Reuters, 2017) which is just 25 percent of their existing capacity. China has captured 85 percent of the solar market whereas India companies are struggling to win contracts. In 2015-16 India imported solar photovoltaic cells worth $2.34 billion (Patel, 2017) and expected to reach $10 billion in few years (Reuters, 2017). Table 2 provides the share of various countries regarding solar PV panels in India. To prevent of cheap and low-quality solar panels in India government must impose a customs duty and create a testing facility for quality checking of imports in the industry sector (Raghunathan, 2017). In fact, all solar companies in India before Ministry of Commerce and Industry, Go I (On 22ndMay 2014) filed for anti-dumping against the import of cheap Chinese, Malaysian and USA solar cell. The prime reason for import of solar wafers (used to make solar panels and other semiconductor devices) is that none of them is produced in India. The plan for setting up of two critical semiconductor wafer plants worth investment of ≠63,000 corer was hindered due to technical issues and queries raised by the government (Bhargavanew, 2017; Doval, 2015). The silicon wafer plant to be established in India is facing overcapacity challenge even before coming into operation being opposed by many companies. All products developed using silicon wafers are just nothing but assembling is done in India (Aggarwal, 2016).

India companies are suggesting Go I mandate domestic sourcing of solar rooftop components to boost native firm's growth, profitability, self-reliance and to inspire confidence among potential customers (Raghavan, 2017).

Five Forces Analysis

To understand the competitiveness and attractiveness of the industry Porter's five forces analysis were done. The fives forces analysis are shown in figure 1. As per the five forces analysis the industry is not at all attractive.

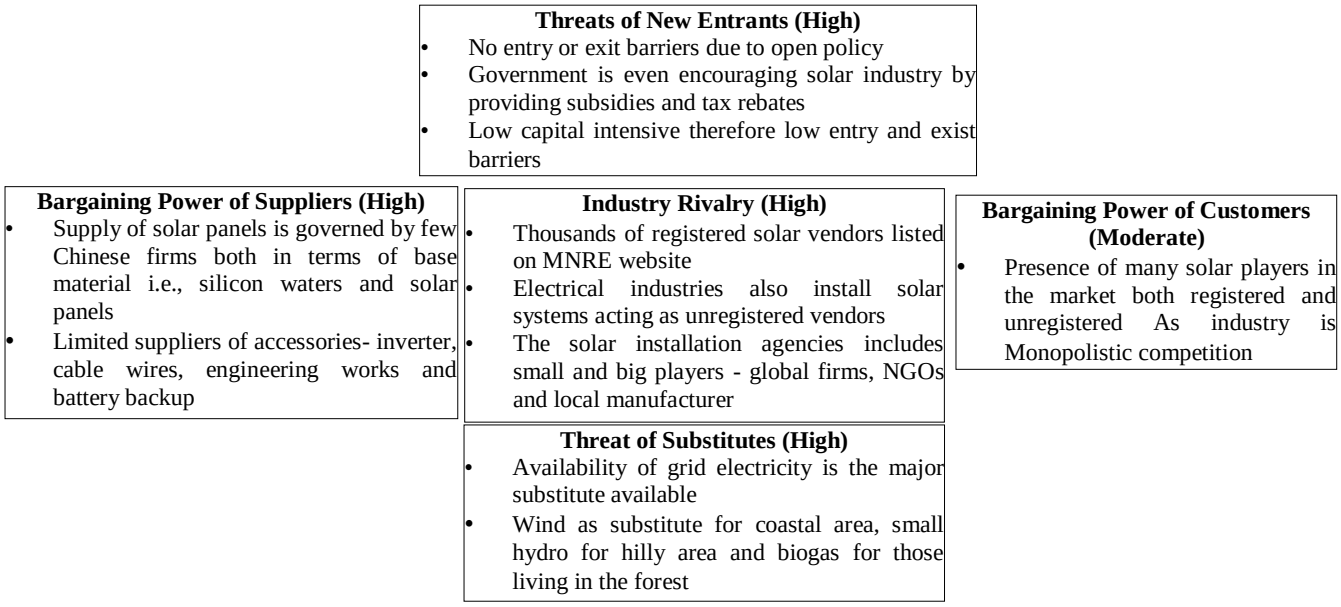

Figure 1 *Five Forces Analysis of Solar Sector*

The solar energy possess huge future potential due to the rising prices of foosil fuel and the comparative decrease in the cost of solar panels and the growingawarness. However, the market is still emerging and the rule of the game is still not clear. Also, on the policy part their are contradiction. Which restrict the attractiveness of the industry for new entrants impacting the profitability of the industry. Due to low return investors and sharholders are not attracted towards the industry leading to more dept finacing of the firms in the solar sector.

7. Conclusion

The study is aimed to evaluate the condition of solar industry in India. The study found that despite all positive support to solar energy in India, the financial performance of solar companies is declining. The lack of equity financing is affecting the day-to-day operating of the sector. On an average solar companies in India are operating at 25 percent of their full capacity only. Such a situation does not augur well both for a fast-growing economy Indian in general and the newly emerging solar industry in particular.

The study concludes that cheap import of solar panels from neighbouring countries (like China, Malaysia, USA and Japan), is causing native manufactures to run for their money as well as excess capacity utilisation. Both the factors are primarily responsible for the poor financial performance of India solar firms.

8. Implications of the Study

There is a strong need to overcome the regulatory and economic barriers that limit the diffusion of solar energy in the country. There is also need for constantly monitoring of the flagship solar energy program. The poor financials of native companies would imply less than needed spend on R&D and other promotional measures. Solar energy is a labour intensive sector and thus has the potential in creating employment opportunities only if domestic companies are promoted. Solar companies are in urgent need of long-term low cost loans to survive.

Government of India can act as facilitator for solar companies by encouraging equity financing of the company through their agencies and prevent reverse bidding which is drastically damaging the entire sector.

The Government of India need to take strategic decision to promote solar industry. The primary component of solar system is silicon wafers which is not manufactured in India at all. Hence, Go I need to reduce or almost remove import duty on silicon wafers and restrict entry of assembled solar panels using through import duty.

9. References

1. Aggarwal, M., & Bhaskar, U. (2017, February 12). Indian solar power tariff hits all-time low of INR2.97 per unit. *The Hindustan Times*. Aggarwal, V. (2016, February 18). Chip blues: semicon manufacture eludes India. *The Hindu*.
2. Albulescu, C. T. (2015). Banks' Profitability and Financial Soundness Indicators: A Macro-Level Investigation in Emerging Countries. *Procedia Economics and Finance*, *23*, 203-209. Retrieved October 10, 2017, from http://www.sciencedirect.com/science/article/pii/S2212567115005511
3. Aliabadi, S., Dorestani, A., & Balsara, N. (2013). The most value relevant accounting performance measure by industry. *Journal of Accounting and Finance*, *13*(1), 22. Retrieved October 15, 2017, from http://www.na-businesspress.com/JAF/DorestaniA_Web13_1_.pdf
4. Al-Matari, E. M., Al-Swidi, A. K., & Fadzil, F. H. B. (2014). The measurements of firm performance's dimensions. *Asian Journal of Finance & Accounting*, *6*(1), 24-49. Retrieved October 15, 2017, from http://macrothink.org/journal/index.php/ajfa/article/download/4761/4198
5. Anand, J. (2012, July 22). Sunburn. *Business Today*.
6. Azeez, A. A. (2015). Corporate governance and firm performance: evidence from Sri Lanka. *Journal of Finance*, *3*(1), 180-189. Retrieved August 28, 2017, from https://www.researchgate.net/profile/Athambawa_Azeez/publication/283194313_Corporate_Governance_and_Firm_Performance_Evidence_from_Sri_Lanka/links/5671065708ae5252e6f29de6.pdf.
7. Bhargavanew, Y. (2017, August 03). Revised semiconductor policy on anvil. *The Hindu*.
8. Bloomberg New Energy Finance. (2016). *Global Trends in Renewable Energy Investment 2016*. Frankfurt School of Finance & Management. Retrieved March 09, 2017, from http://fs-unep-centre.org/sites/default/files/publications/globaltrendsinrenewableenergyinvestment2016lowres_0.pdf.
9. Carr, G. (2012, November 21). Sunny Uplands: Alternative energy will no longer be alternative. *The Economist*. Retrieved March 20, 2017, from http://www.economist.com/news/21566414-alternative-energy-will-no-longer-be-alternative-sunny-uplands
10. Central Statistics Office. (2017). Energy Statistics 2017 (24th Issue). New Delhi: Ministry of Statistics and Programme Implementation (Government of India). Retrieved March 30, 2017, from http://mospi.nic.in/sites/default/files/publication_reports/Energy_Statistics_2017.pdf
11. Delen, D., Kuzey, C., & Uyar, A. (2013). Measuring firm performance using financial ratios: A decision tree approach. *Expert Systems with Applications*, *40*(10), 3970-3983.
12. Doval, P. (2015, May 29). Make in India: Plan for Rs 63,000 crore semiconductor wafer plants hits hurdle. *The Economic Times*.
13. Dutta, S., & Roy, S. K. (2014). Managerial perceptions of a low carbon economy: A study. *Prabandhan: Indian Journal of Management*, *7*(8), 7-20. DOI: 10.17010/pijom/2014/v7i8/59349
14. Hagel, J., Brown, J. S., & Davison, L. (2010). The best way to measure company performance. *Harvard Business Review*, *89*, 1-4. Retrieved August 25, 2017, from https://scholar.google.co.in/scholar?q=the+best+way+to+measure+company+performance+by+John+hagel%2C+Lang+Davison&btnG=&hl=en&as_sdt=0%2C5

15. Herciu, M., & Şerban, R. A. (2016). Creating Value–From Corporate Governance to Total Shareholders Return. An Overview. *Studies in Business and Economics*, *11*(2), 36-50. Retrieved August 26, 2016, from https://www.degruyter.com/downloadpdf/j/sbe.2016.11.issue-2/sbe-2016-0019/sbe-2016-0019.pdf.
16. Hutchinson, M., & Gul, F. A. (2004). Investment opportunity set, corporate governance practices and firm performance. *Journal of corporate finance*, *10*(4), 595-614. Retrieved March 20, 2017, from http://www.sciencedirect.com/science/article/pii/S0929119903000221
17. Indiatsy, M.C., Mwangi, M.S., Mandere, E.M., Bichanga, J.B., & George, G.E., (2014). The Application of Porter's Five Forces Model on Organization Performance: A Case of Cooperative Bank of Kenya Ltd. *European Journal of Business and Management*. 6(16). Retrieved March 20, 2017, from http://erepository.uonbi.ac.ke/bitstream/handle/11295/73376/FULL%20TEXT%20.pdf%20?sequence=1&isAllowed=y
18. International Trade Centre. (1999-2015). *Trade Map- International Trade Statistics*. Retrieved from http://www.trademap.org: http://www.trademap.org/tradestat/Country_SelProductCountry_TS.aspx?nvpm=1|699||||85|||2|1|1|1|2|1|2|1|1
19. Ivanova, T., Havrland, B., Hutla, P., & Muntean, A. (2012). Drying of cherry tree chips in the experimental biomass dryer with solar collector. *Research in Agricultural Engineering*, *58*(1), 16-23. Retrieved March 20, 2017, from http://www.vuzt.cz/svt/vuzt/publ/P2012/004.pdf
20. Jhunjhunwala, A., & Ramamurthi, B. (2017, March 07). Solar energy: Now is the time for India to catch the sun. *The Economic Times*.
21. Jo, H., Kim, H., & Park, K. (2015). Corporate environmental responsibility and firm performance in the financial services sector. *Journal of business ethics*, *131*(2), 257-284. DOI: 10.1007/s10551-014-2276-7. Retrieved October 15, 2017, from https://link.springer.com/article/10.1007/s10551-014-2276-7
22. Kaundinya, D. P., Balachandra, P., & Ravindranath, N. H. (2009). Grid-connected versus stand-alone energy systems for decentralized power—A review of literature. *Renewable and Sustainable Energy Reviews*, *13*(8), 2041-2050. Retrieved August 28, 2017, from https://scholar.google.co.in/scholar?q=Study+on+the+financial+Performance+of+Solar+Company+in+India+&btnG=&hl=en&as_sdt=0%2C5&as_vis=1
23. Khan, M. Y., & Jain, P. K. (2015). *Financial Management: Text, Problems and Cases* (7th ed.). New Delhi: McGraw Hill.
24. Kimmel, P. D., Weygandt, J. J., & Kieso, D. E. (2015). *Financial Accounting: International Student Version.* New Delhi: Wiley India.
25. Kondratieva, K. (2017, May 29). Tata Power Solar revenue doubles to Rs. 2,262 cr. *The Hindu.*
26. M. Porter, Competitive strategy techniques for analyzing industries and competitors, Harvard Business Review. (1980) 4—8.
27. Mashayekhi, B., & Bazaz, M. S. (2008). Corporate governance and firm performance in Iran. *Journal of Contemporary Accounting & Economics*, *4*(2), 156-172. Retrieved August 18, 2017, from http://www.sciencedirect.com/science/article/pii/S1815566910700333
28. NCERT. (2012). *Library and Documentation Division (LDD).* Retrieved November 6, 2017, from http://www.ncert.nic.in/ncert/: http://ncert.nic.in/ncerts/l/leac205.pdf
29. Nuryanah, S., & Islam, S. (2011). CORPORATE GOVERNANCE AND PERFORMANCE: EVIDENCE FROM AN EMERGING MARKET. *Malaysian Accounting Review*, *10*(1). Retrieved August 28, 2017, from http://arionline.uitm.edu.my/ojs/index.php/MAR/article/download/231/146
30. Pandey, I. M. (1999). *Financial Management* (8th ed.). New Delhi: Vikas Publishing House.
31. Patel, D. (2017, July 19). Solar cells & modules: China firms' plan to make in India drags, but exports rise. *The Hindu*.
32. Prasanna, M. G., Sameer, S. M., & Hemavathi, G. (2014). Financial Analysis of Solar Photovoltaic Power plant in India. *IOSR Journal of Economics and Finance*, 09-15. Retrieved August 28, 2017, from https://scholar.google.co.in/scholar?q=Financial+Analysis+of+Solar+Photovoltaic+Power+plant+in+India&btnG=&hl=en&as_sdt=0%2C5&as_vis=1
33. Raghavan, S. V., & Subramanya, K. (2014, July 19). Decentralized Energy Generation- Extending Access at What Price. *Economics and Political Weekly*, 19-21.
34. Raghavan, T. S. (2017, August 26). Mandate local sourcing for home rooftop solar system. *The Hindu*.
35. Raghunathan, K. (2017, May 21). Before sunlight turns shadowy. *The Hindu*.
36. Razdan, A. (2016, August). Energy Sector: The Challenge of Power for All. *Yojana*, *60*, 7-14.
37. Reuters. (2017, June 5). Solar energy boom turns to bust for Indian manufacturers. *The Indian Express.*
38. Sasi, A. (2016, April 13). Solar projects: Ain't no sunshine. *The Indian Express*.
39. Sasi, A. (2017, 19 June). Renewable Energy: Here comes the sun. *The Indian Express*.
40. Shankaranarayana, H., & Ramanath , H. R. (2014). *Management Accounting.* Delhi: Cengage Learning.
41. Sharma, N. K., Tiwari, P. K., & Sood, Y. R. (2012). Current status, policies and future perspectives of Indian power sector moving towards deregulation. *IEEE Students' Conference on Electrical, Electronics and Computer Science (SCEECS), 2012*. Bhopal, India. doi:10.1109/SCEECS.2012.6184730
42. The Indian Express. (2017, June 5). Solar energy boom turns to bust for Indian manufacturers. *The Indian Express.*

43. Titko, J., Skvarciany, V., & Jurevičienė, D. (2015). Drivers of bank profitability: Case of Latvia and Lithuania. *Intellectual Economics*, *9*(2), 120-129. Retrieved August 28, 2017, from http://www.sciencedirect.com/science/article/pii/S1822801115300084
44. Veltri, S., & Mazzotta, R. (2016). The association of board composition, intellectual capital and firm performance in a high ownership concentration context: evidence from Italy. *International Journal of Business and Management*, *11*(10), 317. Retrieved August 28, 2017, from http://www.ccsenet.org/journal/index.php/ijbm/article/viewFile/63074/33857