Information Technology Industry: A Contagious Bubble Ball Ride Accelerating the Socio-Economic Catastrophe

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This paper focuses on the superficially created lifestyle of IT workers; one that is created against their volition with lots of free rides to bubble –balls. It also examines the overall operating characteristics of IT organizations. Present work shows, unusual working hours and stressed out social lifestyle of IT workers start draining health and other resources. Similarly very uncertain future Debt Service Coverage Ratio of IT companies results in depletion of assets in servicing debt obligations. It is highly imperative for all the stakeholders to acknowledge discontinuation of super economic performance in the long run. We were, on the contrary, frightened to observe the abnormal behavior of IT creeping and contaminating other socio-economic sectors. We hint at the disease for these peripherally impacted sectors also in this work.

INTRODUCTION

Sustainable Development has been considered the mission statement of the entire world for years. Almost at the same time the world has experienced a phenomenal growth in the field of IT in India. Indian IT workers are held with much respect throughout the world. In fact it is due to their efforts and accomplishments that India could establish itself as a renowned destination of IT related works.

Unfortunately under the glossy picture lies a dark world of IT workers. They are overworked, stressed out with little time to spend with the family or indulge in recreational activities. As if they are trapped in their own world of IT related activities on which their very own existence depends so heavily. In this paper we focus on the outcome of this activity trap which causes loss of productivity, creativity and innovation, thereby posing a challenge to the intellectual capital that could be preserved for the future.

The IT companies by their extended work hours are depleting the human capital resources every day, to an extent that their potentiality gets diluted and eventually vanishes in the long run. This depreciable

value of human capital is irreplaceable; hence it does not satisfy the criteria of sustainable development. The world economy is aiming towards Sustainable Development but we find that in IT companies, suppression of the individual's potential capability of intellectual exploration is one of the hindrances that diverts the objectivity of sustainable development (Ghatak, ArindamChatterjee, RimuChaudhuri, & Banerjee, 2016).

In our present study, the word "Bubble Ball" is defined as an artificial world which is not sustainable. Here we seek to highlight, the impact of HR aspects, financial aspects, measure of Sustainability index and IT contamination.

OBJECTIVES

1) In particular we seek to find out the level of stress prevailing among the IT employees as well as the reasons for stress among employees across different tier IT companies.
2) Assess the impact of financial aspects on sustainability of Indian IT companies.
3) Come up with a crude sustainability index of Indian IT companies.
4) Hint at the severity of IT infection on other key socio-economic sectors in India.

TOOLS AND METHODOLOGIES

We have chosen 10 Indian IT companies for analysis of solvency aspect. We intentionally chose those companies who are not the known giant ones apart from a few scenarios where no significant information is available for these companies and only the giants provided some information (like Geographical segment wise revenues and R&D expenses information etc.) Most of the data related to company performance are available from various Internet sites.

In case of examining the solvency aspects of these companies, our input is the balance sheet and factors extracted from the SWOT analysis on Indian IT companies (Baber, 2016). We came up with the future expected solvency ratio.

As far as IT employees HR aspects, we have used data collected from Primary sources via questionnaire based survey methods. Total number of respondents to our survey questionnaires were approximately 200.

The target group consisted of 200 employees on PAN India basis. A survey – based on questionnaire, Personal interview and informal interaction was conducted among 140 employees. The age group has been segregated from 25-50 yrs. It included employee with different age group and how they are stressed with the Organizational conditions. The responses were their own judgment and feeling regarding the situation.

The data generated were completely primary data in nature. The collected primary data were suitably processed and analyzed. The synopses of the findings have been shared in this paper.

As far as the variables to measure stress of IT employees are concerned, one has to note that there are a large number of variables in each category. However, we have to reduce the variables to an aggregate index so as to relate it to other measures. Moreover, while studying these variables we observe that most of the variables are related to one another. They also have a natural relation with respect to time, which is an indication of the correlation among these variables. The likely correlation that exists between these variables violates the basic assumption of multicollinearity. When we want to model these

data, this high correlation and the increased dimensionality handicap our efforts. For this, we have used the Principal Component Analysis (PCA) technique, with some innovation to calculate the weights since otherwise they would make no intuitive economic sense, following Raychaudhuri and Haldar (2009).

TABLE 1
SAMPLE SURVEY STATISTICS

Age Group	No. of Employees
25-30 yrs	72
30-40 yrs	51
40-50 yrs	5
*40-50 yrs aged people are found less in the industry and hence in the surveyed data.	

We used Monte Carlo simulation to perform prediction on parameters with uncertain future and volatile past. Some cases we have used a somewhat modified MC simulation values so that exact Normal behavior is not manifested. In those cases instead of averaging out over a run of 1000 simulations, we have taken the **modes** for 5 such separate 1000 iteration runs and taken the average of these mode values. This we think has improved upon the randomness of the MC run values.

For parameters following a given historical trend, we have used **Trend Analysis** to perform Forecasting.

SUSTAINABILITY ASPECTS OF THE INDIAN IT SECTOR

In FY 2015-'16 timeframe, Information Technology Minister in India, Ravi Shankar Prasad quoted saying IT sector in India is going to be stable till 2020. He referred to NASSCOM report where he mentions approximately 3.7 million people in India depend on IT and ITeS industry. In next 5 years 1 million more workers will be added. This is in contradiction to CRISIL report which said recruitment will be halved in next two three years.

In (CRISIL, 2014), we find from a CRISIL report how IT industry in India performed in past and what are its future trends. In FY '13-'14 IT sector in India was a USD $118 Billion industry employing 3.1 million workers. But a warning has been made about the future of Indian IT industry. Because of two reasons hiring in IT services will **shrink to half by** 2018. One reason is global weakness forcing clients of IT companies to cut costs. Another reason is the ever increasing hunger of IT companies to crank up profitability, i.e. revenue per employee. These two forces will slow the hiring growth in IT industry in India.

From FY 2002-'03 to FY 2013-'14, CAGR (Compounded Annual Growth Rate) in IT revenue was 18% but CAGR for employment growth was only 15%. (This actually reinforces our point on IT being a "jobless growth"). The revenue growth will moderate to 13% in the medium term. Hiring has reflected revenue growth so far (with a minor gap of 3%). But the sector is poised to enter a phase where hiring growth and revenue growth will be delinked.

A good way to start analyzing the sustainability growth and sustainability aspects of the Indian IT sector is to look into the SWOT analysis of the same (Baber, 2016).

Strengths

- Cost advantage, since highly skilled IT workers cost a lot more globally.
- A Brand is created as an after effect of hard work all these years.
- Excellent but somewhat incredible Debt to Equity Ratio, Liquidity Ratio and Profitability margins displayed by these companies all these years.

Weaknesses

- Employee salaries are increasing at a tremendous rate, hence cost advantage will come to an end.
- Less R&D investments: this has always been less than 5% mark (as reflected from various financial statements provided by these companies periodically). In a later section we will show that this is a potential threat to sustainability.
- Concentration in a few dominant markets only – subject to external volatility. This can range from currency fluctuations to improvement in foreign market economy, thereby causing foreign investors are to move away from Indian markets

Opportunities

- Government support for Software Technology Parks etc. and Tax Holidays for IT companies (DPI2016), (TaxHolidays2016).
- IT and BPM (Business Process Management) expenses increasing worldwide, rendering Indian IT companies at an advantageous position.

Threats

- Competitive service markets in China and other ASEAN countries can lure customers away from Indian shores.

Lifestyle

The IT sector does not follow Indian labour laws. They are exempted from the benefits like:

- ✓ A ban on employee unions/associations, free hand to hire/fire as the company pleases.
- ✓ Ability to randomly shuffle projects and locations without employee consent.
- ✓ No regulations on work timings or extra hours, etc. might have been necessary in the early 1990s to attract IT investment, but such anti-employee labour practices (which go against all primary conventions of the ILO) cannot be conferred indefinitely upon the IT sector.

The standard rules of the Industry are continuously ignored and avoided by the sector.

Nasscom Report 2013:"Some IT workers are already realizing the bigger picture and are looking at alternative sources of employment. This is what Rohit from Delhi has to say: "I had to quit my job because of neurological problems created by work related stress. I was part of IT industry for almost 8 years and then I had to quit. Now I am looking for alternative career options. IT is one of the most over-hyped industry. After quitting IT I realize now how much I missed on life and life is not just about coding. I used to work for big banking companies. Money was good, but stress too was disproportionately higher. And worse still, role models in IT companies are geeks who simply do not have emotions, any social connections and are megalomaniacs. I have been under treatment for 2 years and not I realize I was becoming a sick guy like my role models. Thankfully I am out of IT and probably able to start my own business and be able to have fuller life."

Analytical Findings

The **Principal Component Analysis (PCA)** is used to compute the factor loadings and weights of these indicators. We have identified the Initial Eigen Values (Total) which are more than one. These are 6.150, 3.480, 2.679, 2.609, 2.059, 1.733, 1.484. Incidentally, in this case, the seven principal components explain 84.13% variance of the variables included in the analysis. Since we have got 26 variables we need to reduce that impact of stress of the IT employees. By PCA we have calculated the principal components which highly influence the cause for stress.

TABLE 2
VARIANCE AND LOADING EXPLAINED

Label	Groups	Components (Factors & Variables)	Description	Loading	% of variance explained
E1	Age and Years of experience	S-1	Age	0.54	29.09%
		S-2	Yrs of experience	0.87	
E2	Impact of Training	S-3	Training imparted per year	.43	22.32%
		S-4	Technical Training (No.)	0.58	
		S-5	Soft skill Training(No.)	0.94	
		S-6	Training Feedback	0.42	
E3	Working Conditions	S-7	Working Hrs per day	0.80	13.10%
		S-8	Work Shift	.73	
		S-9	Work at home as part of the job	.98	
		S-10	Supervise others job as part of your job	0.75	
E4	Work Pressure Affecting Family Life	S-11	Work Pressure affecting Personal Life	0.95	6.53%
		S-12	Time off during your work to take care family matters	0.99	
		S-13	No. of times demands of your job interfere with your family life	0.41	
		S-14	No. of times demands of your family interfere with your job	0.34	
E5	Impact of Onsite Opportunities	S-15	No. of onsite Opportunities	0.64	6.12%
		S-16	Effect of Onsite Opportunities on Personal Life	0.84	
E6	HR Policy-Compensation and Satisfaction with the job	S-17	Extra compensation for overtime work	0.82	5.10%
		S-18	Satisfaction with the Performance Appraisal System	0.79	
		S-19	Satisfaction with the job	0.37	
E7	Time for Self	S-20	Relaxation or pursue activities that you enjoy (No. of hours)	0.45	0.96%
		S-21	Opportunities to develop your own special Abilities	0.41	
E8	Health Condition	S-22	Health Condition	0.75	0.91%
		S-23	No. of times work is found stressful	0.80	
		S-24	Physical Pain due to work Pressure	0.75	
		S-25	No. of times irritations are controlled	0.47	
		S-26	Instance for being threatened or harassed on the job	0.50	
		Total variance explained			84.13%

The eight factors explain about 84 percent of the total variances. However some variables are influenced by more than one factor like – factors E2 to E6 affects both variablesE7, E8. The following classification of the factors is proposed:

TABLE 3
PRINCIPAL COMPONENT FACTORS ANALYSIS

Factor 1: Age and Years of experience It is demographic factor, loading two variables. The variables E-3 and E-4, E-8 had highest loading values for this factor therefore it might be assumed that this factor principally influences E-4and other factors. Studies that have examined emotional experience and age generally suggest that there are decreases in the frequency and intensity of self-reported emotional experience with age. (Gross, Carstensen, Pasupathi, Tsai, Gtestam, & Hsu, 1997)	**Factor 2: Impact of Training** Training and Development are the important factors that influences organizational growth as well employee career development. In IT industry it is seen by the survey report that less weightage is given to this factor. Neither employer nor employees are interested for the same. If at all then it is only in a compliance mode.
Factor 3: Working Conditions E3 is found to be highly loaded as the working conditions of the IT industry are non-standard and it does not comes under the supervision of Indian Labour Laws .Factor E3 is found to strongly influence E7 and E8. In DQ IDC E- SAT Survey in 2005 nearly 22 per cent of the respondents revealed that long work hours	**Factor 4: Work Pressure Affecting Family Life** It loads four variables S11-S-14. The factor S-11 and S-12 are found highly loading which can easily gives us inference that E3 highly influences E4 and leaves a deep impact on the family life.
Factor 5: Impact of Onsite Opportunities It includes two variables. In this factor we see that effect of onsite opportunities has a heavy weightage which justifies that frequent onsite visits hamper their personal life. The factors that were given while collecting survey were: 1 Increased status in society 2 Increased monetary benefit 3.Emotional instability and stress 4 Family detachment 5.Effect of Kids education 6 Kids do not get mother and father both at a time It is found by the survey that 80%(approx) of the people have chosen pt 3,4,5,6.The personal interaction with them confirmed the fact that their kids education is getting hampered due to frequent change of location and kids are suffering from psychological stress	**Factor 6: HR Policy-Compensation and Satisfaction with the job** Factor E6 comprises of 3 variables with maximum loading of S-17, S-18.The traditional Bell curve method of Performance Appraisal system in the IT sector are found to be ineffective on employee point of view. In order to increase the percentage of the average performer they are forcefully distributed in the average category "This year we did not do any forced rankings or curve fitting," TCS chief executive N Chandrasekaran said. "We appraised people based only on their performance. We are now looking at tools to ensure that the feedback process is more continuous, rather than at defined intervals," he told ET. (Source Economic Times: **TCS abandons bell curve based performance appraisal; shifting to system of continuous feedback** played an important part in creating high stress levels at the job. In the survey, one quarter(25%) of respondents said that they find the work stressful, while half(50%) said that it is stressful 'at times'. By *Jochelle Mendonca*, ET Bureau).

Factor 7: Time for Self E7 have two variables which is remarkably influenced by E3.Joffre Dumazedier pointed out that there are three inseparable parts of leisure, relaxation and personal Development, Amusement provides a divergent effect so people temporarily forget worries. Personal Development are the persevering character of leisure. (Chiu, 2008)	**Factor 8: Health Condition and Stress** E8 is highly influenced by E2-E6. India is situated 5 hours ahead of UK, 10 hours ahead of New York and 13 hours ahead of Los Angeles. For corporations, time arbitrage means increased efficiency and cost-savings. But for workers, it results in long hours, an intense work pace, and temporal displacement. Night-shift employees, such as internet banking, security, call centre workers etc. are particularly vulnerable to such displacement, and it manifests in health and safety problems and social alienation. In a study conducted by ASSOCHAM prevalence of obesity among IT sector workers was 18%. It has been noted in other study that a the BMI increases, the CMDQ score significantly increases ($P < 0.001$), and OSI score also increases ($P < 0.001$). (CMDQ) (Sethi, Sandhu, & Imbanathan, 2009),. In a study done among IT workers in bengaluru. The prevalence of hypertension was found to be 31%. Out of which 5% had malignant hypertension. Odds of getting hypertension for those who have used tobacco in their lifetime was 43% higher compared to those who had never used tobacco. In ASSOCHAM corporate survey 2009 it was found that 72% of the IT employees are prone to cardiovascular diseases and 38% have alarmingly high cholesterol levels, one of the key risk factors for heart disease.(Source: Source:- Prevalence of Job Stress, General Health Profile and Hypertension among Professionals in the Information Technology Sector in Bengaluru, India . Rathnaiah Babu, Giridhara)

TABLE 4
CORRELATION MATRIX

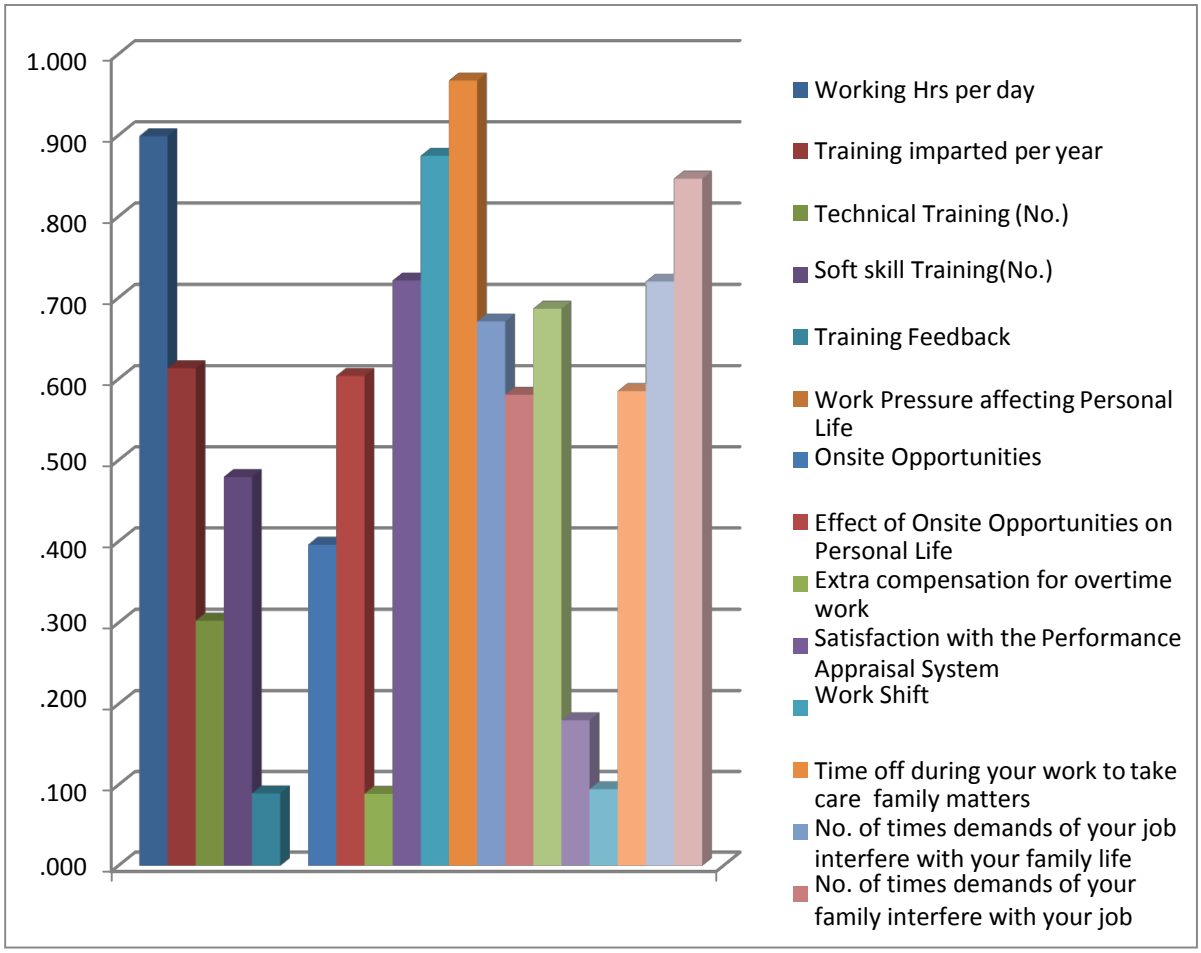
		Age Group	Working Hrs per day	Training imparted per year	Technical Training (No.)	Softskill Training(No.)	Training Feedback	Work Pressure affecting Personal Life	Onsite Opportunities	Effect of Onsite Opportunities on Personal Life	Extra compensation for overtime work	Satisfaction with the Performance Appraisal System	Work Shift	Time off during your work to take care family matters	No. of times demands of your job interfere with your family life	No. of times demands of your family interfere with your job	Work at home as part of the job	Relaxation or pursue activities that you enjoy? (No. of hours)	Supervising others job as part of your job	Opportunities to develop your own special Abilities	Instance for being threatened or harassed on the job	Health Condition	No. of times work is found stressfull	Physical Pain due to work Pressure	Satisfaction with the job	No. of times irritations are controlled
on the job	Sig. (2-tailed)	.000	.000	.155	.000	.403	.781	.237	.000	.000	.213	.000	.696	.308	.095	.000	.000	.510	.000	.032		.000	.598	.020	.000	.000
	N	128	128	128	128	128	128	128	128	105	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128
Health Condition	Correlation Coefficient	.429**	.484**	.321**	.504**	-.014	-.129	.202*	.111	.121	-.078	-.106	-.235**	-.009	.029	-.363**	.417**	-.041	-.366**	-.241**	.568**	1.000	.130	.133	-.532**	.679**
	Sig. (2-tailed)	.000	.000	.000	.000	.875	.148	.022	.214	.220	.384	.232	.008	.924	.742	.000	.000	.649	.000	.006	.000		.144	.135	.000	.000
	N	128	128	128	128	128	128	128	128	105	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128
No. of times work is found stressfull	Correlation Coefficient	.155	-.065	-.127	.104	-.414**	-.143	.036	-.066	.237*	.291**	.507**	.171	.172	-.063	-.204*	.020	-.434**	-.151	-.292**	-.047	.130	1.000	.153	.001	.211*
	Sig. (2-tailed)	.080	.468	.153	.242	.000	.108	.689	.462	.015	.001	.000	.054	.053	.481	.021	.827	.000	.090	.001	.598	.144		.084	.995	.017
	N	128	128	128	128	128	128	128	128	105	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128
Physical Pain due to work Pressure	Correlation Coefficient	-.392**	-.011	.189*	.262**	-.001	-.132	-.049	-.012	.156	.211*	-.022	.516**	-.005	-.079	-.173	-.375**	-.105	.248**	-.103	.205*	.133	.153	1.000	.225*	-.101
	Sig. (2-tailed)	.000	.901	.033	.003	.995	.136	.585	.894	.112	.017	.801	.000	.952	.376	.050	.000	.240	.005	.246	.020	.135	.084		.011	.256
	N	128	128	128	128	128	128	128	128	105	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128
Satisfaction with the job	Correlation Coefficient	-.423**	-.418**	.037	-.108	.090	.098	.009	-.386**	.209*	-.013	.082	.530**	-.101	-.189*	.050	-.473**	.146	.234**	.318**	-.395**	-.532**	.001	.225*	1.000	-.367**
	Sig. (2-tailed)	.000	.000	.679	.225	.310	.270	.921	.000	.032	.883	.358	.000	.259	.033	.575	.000	.101	.008	.000	.000	.000	.995	.011		.000
	N	128	128	128	128	128	128	128	128	105	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128
No. of times irritations are controlled	Correlation Coefficient	.641**	.123	.331**	.380**	.088	-.112	.200*	.284**	.371**	-.137	.115	-.328**	.125	.104	-.308**	.498**	.120	-.454**	-.340**	.507**	.679**	.211*	-.101	-.367**	1.000
	Sig. (2-tailed)	.000	.166	.000	.000	.325	.209	.023	.001	.000	.124	.197	.000	.159	.244	.000	.000	.177	.000	.000	.000	.000	.017	.256	.000	
	N	128	128	128	128	128	128	128	128	105	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128

TABLE 5
CORRELATION MATRIX

Correlations

Control Variables			Working Hrs per day	Training imparted per ye	Technical Training (No.)	Soft skill Training(No.)	Training Feedb	Work Pressure affecting Personal Life	Onsite Opportunities	Effect of Onsite Opportunities on Personal Life	Extra compensation for overtime work	Satisfaction with the Performance Appraisal Syste	Work S	Time off during your work to take care family matte	No. of times demands of your job interfere with your family	No. of times demands of your family interfere with your job	Work at home as part of the job	Relaxation or pursue activities that you enjoy? (No. of hours	Supervisie others job as part of your jo	Opportunities to develop your own special Abiliti	Instance for being threatened or harassed on the	No. of times work is found stress
Health Condition	Work Pressure affecting	Significance (2-tailed)	.899	.614	.303	.480	.090		.396	.604	.089	.721	.875	.967	.671	.581	.687	.180	.095	.585	.720	.847

FIGURE 1
CORRELATION OF HEALTH CONDITION WITH OTHER VARIABLES



We see there is a high correlation between E8 and E4.Overall S3-S-21 has a high level impact on the health condition of the IT employees.

SOLVENCY ASPECTS OF INDIAN IT SECTOR

One key aspect to look into while examining sustainability of Indian IT companies is to check the solvency ratios, i.e., the classic Debt Service Coverage Ratios(DSCR). Below we briefly explain what DSCR stands for and why it is so important as far as analysis of corporate sustainability. In particular we check the Financial Services Coverage Ratios. This is defined roughly as:

= ***(Earnings before Interest and Taxes) / (Interest & premium payment).***

In this work we will consider this as DSCR without any loss of important information.

We collected DSCR information for 10 Indian IT companies (Accel2015). The criteria for choosing these companies are totally random, but one thing we intentionally avoided was to include any of the big IT giants. These giants may be sustainable, at least for the near future, because of their mammoth size and market dominance. But their performance does not truly depict the performance of other Indian IT players, as we will be showing below.

One interesting aspect of the DSCR of IT companies a huge fluctuation of this across the segment. We did a Gini Index and found the inequity quite high (0.72). We see this when compared to other established industrial segments, denotes IT is highly unstable. We found 5 out of 10 IT companies surveyed have too low to moderate DSCR (from negative to less than 10). Hence they have very low future prospects.

For most other companies DSCR is high (1, with value 50+), in some cases extremely high (4 of them having values in the range 100+ to 1000+). Let's look at what is happening here more closely.

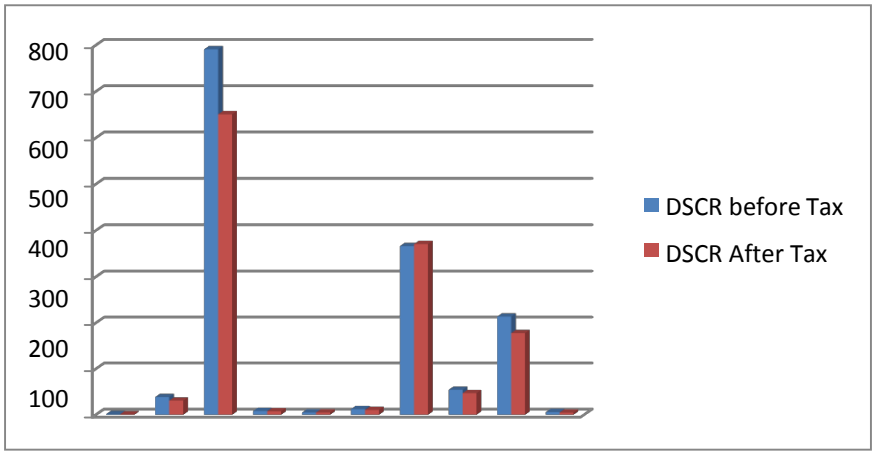
Crudely speaking, ***DSCR*** $\propto$ ***Revenue*** and **DSCR** $\propto$ **(1/Debt burden).** A (extremely) high DSCR implies either Revenue high or Debt burden very low.

If we look at the high revenue aspect, most of these companies have revenues from less than Rs. 1 Billion (USD $ 17m) on the lower side to Rs. 14 Billion (USD $250m) on the higher side.

For the debt burden, most of these companies have very low debt. Range starts from as low as Rs.300 millions (USD $5m) to Rs. 6000 millions (USD $100 m). A significant portion of this liability consists of future provisions, which have no interest burden.

We have done a correlation coefficient calculation between DSCR and Revenue (value is 0.45) and that between DSCR and Liability (value is: -0.15, the negative sign here depicts the inverse relationship). Thus we see DSCR has more loading from the Revenue component and less from the Debt component. But the later is not a very reliable measure as we have considered total liability, a good % of which is not interest bearing.

FIGURE 2
DSCR FOR VARIOUS COMPANIES (BEFORE AND AFTER TAX)



Let us now look into these loading factors in more details.

1) Revenue Component

Revenue component consists of three major subcomponents: Revenue (the actual profit from the business) -minus Interest (which reflects the debt burden) –minus Taxes.

Tax component is very low, as Govt. of India has given sops in the forms of Tax breaks and Tax Holidays for years to these companies. The value of DSCR before Tax and DSCR post tax as shown in Fig-1. We find these values are roughly equal across the board. This is an implication of the absence of any Tax component in the IT sector. But will it last?

Is Revenue going to be higher? Let's look at Table-6 below.

In the analysis we have chosen a company so that our calculation can be simplified. This is a good candidate because most of the parameters examined lie in the median for these cases. Exceptions are: R&D expenses, where we have chosen an IT giant as other companies have very insignificant amount of R&D expenses. Similarly for segregating revenues (% wise) across geographical regions, we have chosen a giant as our 10 candidate companies do not produce explicit data in this regard.

Cost of Operations: This value is directly available from the Balance sheet for 2010 and 2015. We have used the Forecasting technique in Excel to come up with the figure for 2020. Then we have normalized these values in (0,1) range.

Cost Advantage: We have crudely taken the dollar to rupee conversion ratio as the cost advantage. The justification is that this ratio directly translates to attracting FDI in the IT sector as the cheaper rupee tends to put lesser burden on IT spending by foreign investors. While the values for 2010 and 2015 are available, the value of 2020 had to be calculated using the Monte- Carlo simulation, as the market is very unpredictable.

Concentrated Markets: Since data for the companies we are investigating do not give meaningful or significant data for the geographical regionwise breakup, we took the data for a

giant as a cue (TCS1415). Data for FY 2010 and 2015 are available from (TCS1415) and the forecast for 2020 is obtained using MC simulation.

Global IT Expenses: The data is from the sources as in (1) and (2) mentioned in Table - 6. **Competitive service market**: There are two excellent references available on this and they are cited along Table 6. While (3) refers the figure for 2015, (4) refers to 2008 and we take that value for 2010 as approximation. The 2020 figure was derived as a simple average on 2010 and 2015 figures. The reason is

that 2020 will see more and more players competing the global IT revenue pie and some emerging markets like China, Africa and Philippines appearing as able competitors. So 2020 will definitely see a lowering of India's share in the global market.

Financial Ratios: The rational for coming up with the figures is existing data. The 2020 data is available via Forecasting using Simple Trend Analysis.

Brand: Since this is a highly qualitative attribute, the only way we could think about some measurability is using MC simulation along with our own perception of the brand value. Our perception of the gradual lowering of India's dominance in world wide IT market is indicated by lowering figures.

Government Support (Taxes): The 2010 and 2015 figures show a tax break of 100%.

But to obtain values in 2020, we again used MC simulation.

Research & Development Expenses as % Total Earnings: The figure is from an annual report (Infosys1112), (Infosys1415). Again we did not find sufficient data for our target companies, hence we had to resort to a giant.

From the above figures we calculated Total Prospects. This was then tied to the actual annual revenue growth during this period. We see the ratio between Predicted value and Actual revenue growth tallies for 2010 and 2015 (in Table 6). This lends a credibility to our predictive model. From the calculation we predict that the annual growth revenue will **come down** to the level of **11% in 2020** time frame and this will be the general situation for the Indian IT sector as a whole.

Practically speaking, why should this kind of a downturn happen for the Indian IT industry as a whole? In many of the existing literature published by the likes of IBEF, WTO and NASSCOM a rosy picture is actually presented about the IT revenue growth aspect of India. But listed here are a few key event indications towards the opposite direction.

TABLE 6
TOTAL IT REVENUE TRENDS & PROSPECTS

Rank	Weightage	Sign	Item	2010	2015	2020	
1	0.138888889	-1	Cost of Operations	0.33	0.66	1	From Balance sheet (normalized)
2	0.131944444	1	Cost Advantage	0.4	0.6	0.6	
3	0.125	-1	Concentrated Market	0.73	0.78	0.7	
4	0.118055556	1	Global IT expenses increasing	1	0.87	0.56	(1) data is for 2013 Source is (2)
5	0.111111111	1	Competitive service market	0.54	0.67	0.62	Data for 2010 is actually for 2008 from (4) Data for 2015 is from (3)
6	0.104166667	1	Financial ratios	1	0.56	0.31	Simple Trend Analysis and Forecasting by Excel (Normalized)
7	0.097222222	1	Brand	0.9	0.8	0.68	

8	0.090277778	1	Govt support	1	1	0.85	
	0.083333333	1	R&D Expenses	0.16	0.17	0.18	Rough estimates
	Total Prospects			0.39	0.31	0.18	
			Annual Growth Rate	0.24	0.18	0.11	

(1) Data for 2013

(2) From: http://www.gartner.com/technology/research/it-spending-forecast/

(3) http://www.ibef.org/industry/information-technology-india.aspx

(4) from The Global Opportunity in IT Based Services published by the World Bank and retrieved from : http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/ Global_Opportunity_IT_Based_Services.pdf

Recently, US presidential candidate Donald Trump has expressed vehemently against the H1-B visa and outsourcing of IT BPO services to India very openly (Trump2016). In past US president Barrack Obama has done the same (Obama2016). Recently Infosys ex-CEO Narayan Murthy has termed Indian IT companies as immigration agents (Infosys2016). Lawsuit to the tune of USD $1B was filed against TCS recently in a USA court (TCS2016) . Please note that many of these crisis related to not actual criminal offence but related to international difference in perspectives of these regulations.

2) Debt Component

There are quite a few points to ponder over here.

According to Modigliani–Miller theory of Capital Structure (with addition of Corporate Tax effect in their model), primary benefit of debt stems from the tax deductibility of interest payment (Bhattacharjee). Since there has been tax sops by government in past, Indian IT companies naturally avoided debts.

There is another aspect to the correlation between government support and equity orientation. In the last decade or so, market regulations of various kinds, SEBI (Securities and Exchange Board of India), MOF (Ministry of Finance) etc. have boosted he primary issue market in India by a huge number of incentives like ELSS (Equity Linked Savings Schemes), investor protection etc. Hence plethora of IPOs (Initial Public Offerings) and capital market rush has happened in recent past. But since that phase is over and Indian Financial markets are better regulated these days, new investors may not find any really new point of attraction towards crowding the equity segment.

If we look into the Debt to Equity ratio, this in general is low for industries with volatile demand and fluctuating profit (Bhattacharjee). These companies all relate to the Question Marks category industries of the BCG Matrix. But Question Marks industries tend to be unsustainable to a large extent.

By contrast, "established" companies with high margins and poor growth prospects go for less debt (or more long-term easy debts). But these companies are very generous as far as paying dividends to the shareholders at the cost of a lesser amount of retained earnings ratio. IT sector is in the seemingly perpetual growth track, hence its appetite for debt should be more. But they have less debt component. Can this be that they are maturing to a less growth stage? But then their dividend payout ratio should be more. Interestingly, we note that even though IT companies have lower dividend payout and higher cash retention ratios, and even though their revenue growth prospect is slowing down (indicative of a more maturing state of the industry), they are able to fulfill most of their growth prospects using mostly an all

equity based approach. They have almost completely avoided the debt component. We encounter a dilemma here.

The absence of debt component reduces the financial leverage. It makes investors wealthier as their return exactly mimics the return of the business of the company, but:

- The return is anyway not very high (in absolute terms) compared to other matured industrial sectors like Oil & Energy, Steel, FMCG etc.
- The EPS (Earnings per Share) is lower than it could be
- Almost all the business risk has to be shouldered by the investors.

It is not a coincidence at all that in past we have come across severe accounting scandal of Price Waterhouse Coopers (PwC) in 2001-'03 timeframe; the Satyam fiasco in 2008-'09; the recent invasion of German police force to Indian IT companies because of trade malpractices as reported in (GermanPolice). All these are indicative of the risk component getting the upper hand of bullish IT investments.

A very high Interest Coverage Ratio indicates firms are (very) conservative in using Debt. Now why is this conservativeness? One reason could be that firms are not expecting sustainable growth, hence they are not willing to take big debts for expansion. If they take big debts, and if the market is uncertain, then they may not be able to service debt obligations. In case of an equity oriented approach, this is not the case. In fact Indian IT firms are not even 10% oriented towards paying off dividends. Together with this if we add the poor and uncertain revenue growth aspect from Table-6, we understand it is probably true that Indian IT firms are very conservative as far as debt component is concerned.

From (Love & Peria), we find another aspect to the low debt level of IT companies. One reason could be that the IT sector is seen as a very risky segment (we have already analyzed this is not at all false) by loan providing financial institutions (like banks) and hence shun by these institutions as far as loan disbursement is concerned. Hence low debt levels actually may reflect an unsustainable IT sector. This just corroborates our analysis in the preceding paragraph.

From (Sultana & Pardhasaradhi, 2012), we note the authors have identified a few parameters Indian equity investors especially look for while taking a decision on investing in equities. In (Jagongo & Mutswenje, 2014), we see a similar picture in another stock exchange (outside India, in Nairobi, Kenya, another emerging equity market with a somewhat similar investment scenario). In both cases the following parameters were identified as the key ones: a) **The company financial performance factors** like: Wealth Maximization, Financial Expectation, Accounting Information, Expected corporate earnings, profit and condition of statement, Expected dividend etc., b) Brand Perception & Reputation of the firm, Social Responsibility etc. related to the **public perception about the company** but generally not associated with financial performance as such, c) Government & Media, Economic Expectation etc. i.e. consistent factors which **depend on the investment climate** and not on individual firm performance, d) Firm's status in industry, Past performance of stock of the firm and Price per share, Risk Minimization etc. factors which we think **are variable parameters** and beyond the control of any farm. In the analysis related to debt to equity performance we avoided the factors inside (d) as we think these are extremely volatile in nature, with very tenuous links to the company performance analysis. Hence we dropped (d) from our analysis and concentrated on the groups a) b) and c).

In Table-7, we have shown the following factors for our analysis on the equity orientation:

Factors i)Acceleration / deceleration of Super economic growth, ii) Cash available for growth plans, iii) Dividend less growth appear as in (a). iv) Brand and v) R&D Expenses to Total Earnings Ratio are from (b), vi) Government support and vii) Risk tolerance of equity holders are as in (c). Here we describe how we came up with the various entries in the Table 7.

Acceleration / deceleration of Super economic growth, Brand, R&D Expenses to Total Earnings Ratio, Government support - these factors are directly available from Table 6. For the **Dividend less Growth** factor, we have uniformly used the value 1 for 2010 and 2015, to indicate these companies are 100% dividend less. For the 2020 timeframe, we have arbitrarily assumed 10% dividend will be disbursed. The rationale behind this is the continuous maturity the IT industrial segment is assuming by days. Almost none of these companies provide with any sort of dividend till now and being a

new industrial sector, it was okay in past to have dividend less behavior. But as we have pointed earlier, this is bound to come under question. We have indicated the 0.9 weightage point for the 2020 prediction to include this consideration in our analysis.

The numbers of for **Risk Tolerance of Equity** holders are again available via MC simulation. The **Cash available for growth plans** factor values are calculated from Table-6. We get the Revenue growth values from Table-6. The Dividend % is from Row 4 of Table- 7. Subtracting the Dividend values from Revenue gives the Cash Available value. We have normalized this value.

We note from Table 7 that the Equity Component is sure to come down. For one thing, the predicted Affinity is supposed to come down marginally (from the uniform levels of 0.4 to 0.38). But more significant drop should come from the Gap in Predicted vs. Actual P/E ratio values. We note this gap is already 9 in 2015. So with a predicted value of 24 in 2020, the drop in equity orientation can see a drop of more than 30% in coming few years. On top of this if we observe the P/E ratio of a matured sector is in the range of 16, a bigger drop in share of equity is not remote. There is a good possibility that this downward trend in equity has to be compensated by going in for more debts. This again poses a dilemma. If IT industry in India has to sustain, it has to reduce its equity component and increase its debt percentage. But having more debts, coupled with reduced revenue growth in future, is going to weigh upon the DSCR values as we show below. But lower DSCR value is a threat to sustainability. So IT industry in India is getting itself into an invisible conflict with itself it seems.

TABLE 7
EQUITY COMPONENT TRENDS & PROSPECTS

Rank	Weightage	Sign	Item	2010	2015	2020	
1	0.1808318	1	Acceleration/ deceleration of Super economic growth	0.39	0.31	0.18	From Table 6
2	0.1681736	1	Government support	1	1	0.85	From Table 6
3	0.1555154	1	Risk tolerance of equity holders	0.93	0.83	0.69	Using MC Simulation
4	0.1428571	-1	Dividend less growth	1	1	0.9	
5	0.1301989	1	Cash available for growth plans	0.38	0.69	1.00	
6	0.1175407	1	R&D Expenses to Total Earnings Ratio	0.16	0.17	0.18	From Table 6
7	0.1048825	1	Brand	0.9	0.8	0.68	From Table 6
			Predicted Equity Affinity	0.40	0.40	0.38	
			Predicted P/E Ratio	26	26	24	
			Actual P/E Ratio	26	35	??	
			Gap in Expectation vs. Actual Performance	---	9	---	
Predicted P/E ratio for 2010 is the actual value - this is the baseline							

COMPUTATION OF THE PREDICTED DSCR

We are going to compute the DSCR from the values of projected revenue growth and the projected debt component. The values are shown in Table 8.

TABLE 8
PREDICTED & ACTUAL DSCR

	2010	2015	2020	
Revenue	38	69	100	From Table 1
Growth rate		15%	11.00%	From Table 1
Dividend (%)	0	0	10	From Table 2
Debt (%)	2.5	10	25	Assumption
Cash Available	37.05	62.1	65	
Predicted DSCR	148.20	62.10	26.00	
Actual DSCR	153.44	54.35	----	

We note from Table 8 that with our model and with a little bit realistic assumption, the predicted value of DSCR closely matches the actual values for 2010 and 2015. We strongly believe the value for 2020 is bound to match.

Now the last question remaining, when is the end for IT companies going to come? This can be predicted once we know when the DSCR value will come close to 1. We will show via some scenario analysis what are we going to expect.

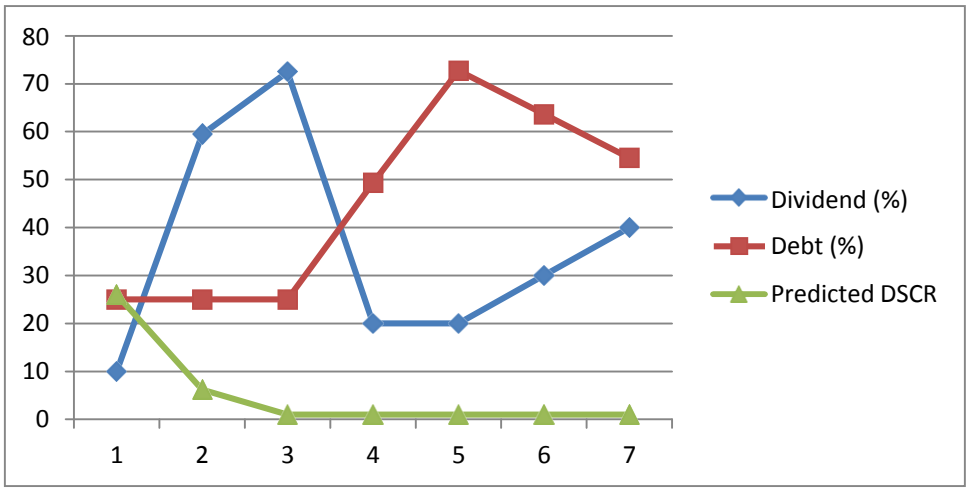
TABLE 9
DIVIDEND, DEBT AND PREDICTED DSCR

Dividend (%)	10	59	73	20	30	40
Debt (%)	25	25	25	73	64	55
Predicted DSCR	26	6.21118	1	1.0	1.0	1.0

Here we have a modified DSCR where we have included the effect of Dividend also. In the Table-9 we see how the DSCR varies with various levels of Dividend and Debt % five years from our analysis time 2020 (i.e. we look for year 2025). This table is created using the Goal Seek option of What-if Analysis method in Excel. We note that with debt kept at 25%, the Dividend has to be really high (73% - which is a far cry in a growth industry like IT) for DSCR reach the bottom (i.e. close to 1). But if we vary Dividend, we see that with 20% dividend level it needs 73% debt to get to bottom. This is also safe as we do not expect debt level to be that high. But with increasing Dividend level to 30% and 40%, we note that the debt level comes down to 64% and 55% respectively, which are dangerous territories. The same relationship is depicted well in the figure shown here. From Table-9 and Figure-3, we can conclude by 2025, the company may not be able to sustain its business ventures anymore.

Also note that DSCR does not in any way depend on the actual Revenue growth, as shown here, as this is essentially a ratio between Revenue and Interest, but the later is also a function of Revenue. Still we cannot ignore the effect of Revenue growth as it affects the available financial resource (like cash) needed for supporting growth strategies. If the cash available amount is less, a company has to resort to more debt (when the equity option is less viable) and hence more pressure is generated on the DSCR.

FIGURE 3
DIVIDEND, DEBT AND PREDICTED DSCR



MEASUREMENT OF THE SUSTAINABILITY INDEX (SI)

Now we are going to come up with our own considering all these parameters. In (Love & Peria), we see a good amount of review for existing SI determination. Here we briefly state some of these which have some relevance to our discussions.

FAO (Food and Agriculture Organization) type of Sustainability

The two relevant measure here are:

1) *Economic and Financial Sustainability Approach:*
   - Very much relevant to (Indian) IT sector.
   - This states that use of heavily subsidized activities hamper both economic and financial sustainability. We have already discussed the impact Governmental support is affecting the Revenue and sustainability in preceding sections. Here it just reconfirms our findings that this kind of support actually make companies survive longer but in the long run it is difficult to continue these subsidies. The company then finds itself in trouble. So the advocates of this SI strongly suggests not to extend this support at all
2) *Sustainable enterprise Approach:* In this approach, "sustainable innovation" is a key point. But R&D expenditure (as a % of total revenue) is miniscule in Indian context as we have already pointed out. Hence we note that according to this approach, Indian IT companies have little to hope about sustaining in the long run.

Development sustainability approach

Some of the key items are:

1) *Financial sustainability*: training in local fundraising; links with private sector sourcing of funds; policy reforms; etc.

2) *Economic factors*: In a weak economy, projects should not be too ambitious. In this regard, BPO type of projects off shored to India signals positive trend as most of these project have very little ambitious goals. May be these have little competition, lasts longer as the job is routine and periodic in nature, and requires lower skill levels and hence are more inexpensive. They all point to more sustainability.

Having pointed out these existing SI methods, we have calculated our own SI based on Debt Service Coverage Ratio & HR Aspects. The later is actually included in the 'Sustainable Enterprise" approach. We have already talked in detail about the former item.

Here we create two separate indices, one for measuring Financial Sustainability, the other for HR Sustainability. Then we show how we can create a composite score out of these two.

TABLE 10
HR SI CALCULATION

Rank	Weightages	Factor	Factor Groups	Performance
1	0.19	E4	Work Pressure Affecting Family Life	0.45
2	0.18	E3	Working Conditions	0.72
3	0.17	E8	Health Condition	0.52
4	0.16	E6	HR Policy-Compensation and Satisfaction with the job	0.34
5	0.15	E7	Time for Self	0.15
6	0.14	E1	Age and Years of experience	0.75
			Total	0.49

Human Resources Sustainability Index (HRSI)

As we mentioned above that calculating the HRSI is a component for the overall Enterprise Sustainability Index. Here we calculate essentially the HR Development Index to measure the sustainability index.

We have used the performance values from the data set (collected via the survey) for a company not very big. Just like the case of NIIT, we will assume most of the other similar companies will follow a similar patter without much exception.

Financial Sustainability Index (FSI)

We have used the correlation index between DSCR and Revenue as well as between DSCR and Debt to come to the calculation of the Financial Sustainability Index (FSI). The loading values are calculated as 0.7 for Revenue component and (-)0.3 for the Debt component. [These values are coming from the correlation coefficient between DSCR and Revenue/Debt we calculated earlier for Table 6. There the values were 0.45 and (-) 0.15. We have taken an approximate normalized value set here]

The formula for the FSI is:

$$FSI = 0.7*(1 - dividend - interest\ on\ debt) - 0.3*\ interest\ on\ debt \quad (1)$$

$$= 0.7*\ (1 - dividend) - debt \text{ [in short for interest on debt]} \quad (2)$$

We fit in a second order curve for the *FSI* (i.e. *X* variable) against the number of years *f(X)* the company is to survive its operation.

Note that if dividend and debt components both are 0, the *FSI* (i.e. *X*) = 0.7, and this indicates a company is run forever. We assume a very high value for *f(X)* in that case for ease of computation, say *f(X)=100*.

For maximum values of dividends and debts, we get minimum value of *FSI= -1* and *f(X)=0* in that case (i.e. the company is in liquidation).

Our efforts above give the following equations:

$$f(X) = a*X*X + b*X + c, \text{ a,b,c are constants}. \quad (3)$$

Putting the boundary values above we get (after some algebraic manipulation):

$$f(-1) = 0 = a - b + c = 0$$

$$or, \quad a + c = b$$

Thus $f(X) = a*X*X + b*X + c$ becomes.

$$f(X) = a*X*X + (a+c)*X + c$$

$$or, \quad f(X) = (X+1)(a*X+c) \quad (4)$$

Similarly, after putting $f(0.7) = 100$, we get

$$100 = (0.7 + 1)(a*0.7 + c)$$

$$or, \quad 1.19a+1.7c = 100 \quad (5)$$

We manipulate constants *a, c* to show that when dividend = 40% and debt = 55% (0.55) (this is the data we used in Table 9), we get FSI, i.e. $X= -0.13$, and the DSCR value approaches to 1. This we assume to mean that the company has enough resource to meet the interest obligations for just one more year and then will cease to exist operating. Thus *f(0.13)* can be taken as 1. From the above discussions, we get

$$-0.13a + c = 1.15 \quad (6)$$

Now we can solve *a,c* using equations (5) and (6) to get:

$a=70$ and $c=10.4$.

Supplying these values in *f(X)* we get:

$$f(X) = (X+1)(70X + 10.4) \quad (7)$$

Solving for X, when $f(X) =5$, i.e. the company should survive for at least 5 years (as was done while calculating DSCR values in Table 9 for the 5 year period extending up to Year 2025), we get

$X= -0.07$.

Note X is the FSI. Thus we back calculate from the FSI equation above, the corresponding debt level, keeping the dividend level as in Table 9. We come with alternate values of debts as shown below in Table 11.

TABLE 11
PREDICTED DEBT VIA FSI AND TABLE 7

Dividend	30.00%	40.00%
Predicted Debt via FSI	56.00%	49.00%
Predicted Debt in DSCR (from Table 9)	64.00%	55.00 %

Note how closely the debt values predicted from Table 9 and the same values predicted from the FSI calculation match. This establishes the consistency in our approach.

For the 2015 timeframe, (with debt at 10% and dividend at 5%) we get the FSI value as : 0.565. This is the value will be using for calculating the Composite Sustainability Index (CSI) as shown below.

Composite Sustainability Index (CSI)

Since we do not have much information about how much weight to put to HRSI and FSI while calculating the CSI, we will use an averaging approach to show with various weightage WH and WF for HR and FSI respectively to come up with various CSI values.

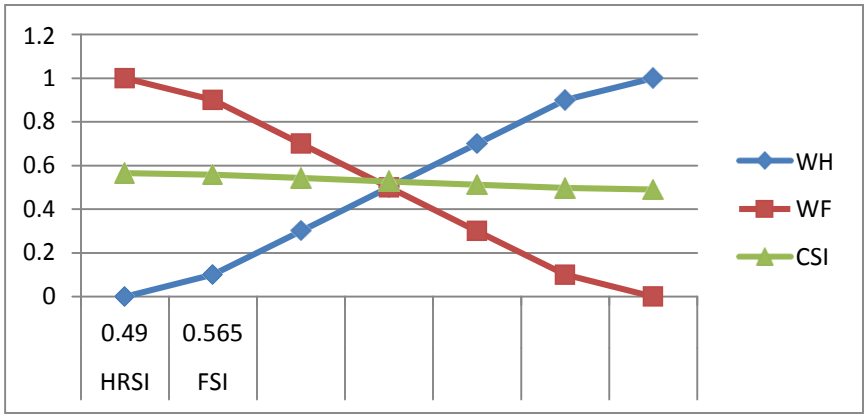
We see from the Table – 12 and the corresponding Fig 4, that as of 2015, the lowest point occur when W_H =1, that means the HRSI is dominating the performance of the CSI.

TABLE 12
HRSI, FSI AND CSI

Index		WH	WF	CSI
HRSI	0.49	0	1	0.57
FSI	0.565	0.1	0.9	0.56
		0.3	0.7	0.54
		0.5	0.5	0.53
		0.7	0.3	0.51
		0.9	0.1	0.50
		1	0	0.49

The figure below depicts the same relation in a nice graphical format.

FIGURE 4
HRSI, FSI AND CSI



IT CONTAMINATION ASPECTS

We have already seen in discussions above that the IT industry in India is definitely in a track that is not going to sustain very much in future. The HR depletions and bubble ball ride of the lifestyle is depleting HR assets fast. Also in an endeavour to satisfy appetite for unreasonable growth percentage, companies are depleting their financial resources as well. The most dangerous aspects of this dangerous tide is the contamination it is crating on other sectors. We have chosen education and banking as two sectors where we made a small amount of survey to get a hint at how adverse these segments are impacted by the peculiar IT culture. We have surveyed approximately 10 respondents in these two sectors. Below are some key findings:

TABLE 13
IT LIKE SYMPTOMS IN ACADEMIC AND BANKING SEGMENTS

Industry segment	**Academic**	**Banking**
Employees working Extra working hours: (%)	20	10
Stress level at job	2	3
Own any credit card (%)	20	0
Average monthly credit card balance (Rs. '000)	15	0
Employees paying shopping mall visits per month (%)	40	100
Monthly average amount paid for luxury items (Rs '000)	2	10
Number of Restaurant visits per month	2	2
Body Weight (Kg)	71	70
Any major health problem	N	Kydney, Asthma
House loan total amount (Rs. Lakhs)	11	10
Any other debt amount (Rs. Lakhs)	0	3.5

Job stress level: 2, Medium; 3 means High.

We see from Table-13 that in both these segments (Academic as well as Banking) there has been significant IT contamination. People are working more, with higher stress levels. Many of them are paying regular visits to shopping malls or restaurants (a hitherto unheard of habit among working class population of India) and buying luxury items. Some of them own credit cards with some balance also. Many of them are having a significant amount of house loan amount or other debts. Indian workers in past shunned such consumption debts entirely. Also with their more stressful personal and professional lifestyle, they are incurring some major health problems also. All these we claim is an after effect of the IT culture. Please note that our study here is just meant for a hint, and this needs to be supplemented by more survey, field work and methodical analysis to get to any conclusive results.

CONCLUSION

We hereby summarize our findings from the present work as follows:
In conclusion we can zero down to the point that there is a severe correlation between work pressures and the health condition which are posing day to day stress to the IT workers. So, the present scenario cannot sustain in the long run with such deletion of human capital. On the other hand we have shown that higher DSCR is not sustainable with :

a) very uncertain and improbable revenue growth prospects,
b) possibility of threat from withdrawal of government tax sops and other forms of subsidy,
c) high possibility of cash retention ratio dropping,
d) the gimmick of nascent IT industry going down and more matured industrial setting appearing, repelling equity investors with high risk taking propensities.

These companies should see a reduction in revenue growth, increase in tax payment and increase in Debt to Equity ratio. This in turn will result in increased interest burden. High DSCR is bound to come down. We fear it may get reduced to such a level as to threaten the solvency of these companies and make their business unsustainable in the long run. We came up with a fairly comprehensive measurements of composite sustainability This tends to reinforce our analysis in about how sustainable Indian IT companies are.

Finally we have given some hints as to how some of the adverse aspects of the peculiar IT culture is affecting other sectors. We have done some survey on Academic and Banking sector workers. We note that a significant % of these workers are also lured into the worlds of consumption, even at the expense of debt burdens. They are habituated to working under stressful conditions. As a result, they are treading dangerous paths and many are getting vulnerable to complicated diseases. A more comprehensive work in this regard, spanning more sectors and a significant population, is needed to confirm the level of this contamination.

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