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Analyzing the Impact of Companies' Investment on Skill Upgradation in Improving their Resilience amidst COVID-19

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Abstract: On the job training has always been viewed as an avenue to improve the production and productivity of companies. In the dynamic world that we live in on the job training and skill upgradation has become very important for all the companies to stay relevant in their domain. This holds true independent of the size of companies in question. It is more so needed in India, wherein what academia offers to our graduates is not in line with Industrial requirements. In our study we have analyzed the impact of on-the-job training and skill upgradation on company's ability to overcome the demand shock caused by pandemic. To understand the same, we have used GARCH model to analyze the rate at which shock caused by COVID-19 subsided among large, mid, and small cap companies. Through our empirical analysis we were able to conclude that, large cap companies who were spending substantial amount on skill upgradation of their employees were able to revert to normalcy at a higher rate as compared to mid and small cap companies.

Keywords: On the Job Training, Skill Upgradation, GARCH model, shock subsidence

Introduction: If any of the companies want to compete among the best in the market, that too in this fast-changing dynamic world, then regular training and development of skills of their employees is indispensable, (Walters et al., 2017). On the job training not only helps employees to sharpen their existing skills but it shall also help them to acquire new skills, thereby increasing their efficiency and productivity (Elnaga, A., & Imran, A., 2013). Independent of the size of the company, on the job training is important. At international level large cap companies like Amazon, American Telephone and Telegraph, Tesla provide intensive on the job training to their employees to ensure that they have the necessary skills set to excel at their job. Even in Indian companies like Infosys and Tata Consultancy services, intensive training is provided to their new recruits. Relevance of on-the-job training is not lost upon mid and small cap companies. Based on their resource base, mid cap and small cap companies provide training to ensure that their employees are job ready. Given, the skill gap persisting between industry and academia, on the job training becomes all the more relevant.

Literature Review: On the job training can be regarded as a systematic and formal behavior that develops through education, instruction and planned experience (Richard Pfau, 2005). Given the glaring gap between what is offered in academic institutions and what is expected in industries, on the job training has become an essential tool to not only assist graduates to become employees but also regularly update employees, so that they remain relevant and productive in their domain (Arinanye, R. T. 2015). Even in international domain, despite western countries having world class education system, on the job training is very much prevalent even there. According to Association for Talent Development, direct expenditure per employee on training and development has increased significantly in recent years. For instance, Organizations, on average invested \$ 1208 on 2014 to \$ 1252 in 2016 (Walters et al., 2017). This investment was done on enhancing skills of employees ranging from managerial,

supervisory, customer services sales, interpersonal skills and others. On the job training helps the organization in improving the skillset of their employees and such development programs improve the production and productivity of company, thereby making the company more resilient (Bapna, R. et al.2013;Ho, M. et al., 2016; Sree, Vasanthi & Rabiyaathul, S. 2019).

Research Gap: As of now many descriptive research has taken place which have portrayed the importance of on-the-job training on improving productivity (Kanu Raheja.,2015). However, in Indian setting such empirical studies are very few and far in between. In the backdrop of a global economy recovering from pandemic, our paper seeks to bridge the gap.

Objectives:

1. To descriptively evaluate the importance given to on-the-job training by companies of varying size.
2. To empirically analyze the rate at which large cap, mid cap and small cap companies revert to mean after the demand shock caused by COVID-19.

Hypothesis:

1. Independent of market cap of companies in question, there shall be no difference in the rate at which the companies shall be able to overcome their demand shock caused by COVID-19.

Research Methodology: The objective of our paper was twofold. On one hand we wanted to analyze whether the funds allocated by the companies depended on the quantum of the resource base they already had. To analyze the same, we have relied upon secondary data. Our next objective was to empirically analyze the rate at which different companies would overcome the demand disruption which has been caused by COVID-19 pandemic. For analyzing our second objective, we have relied on the Nifty’s classification, which categorizes the companies into large cap, mid cap and small cap companies based on their market capitalization. We have taken these companies’ share prices as a proxy for analyzing their performance during January 2020 to December 2021. The rationale behind choosing the period we have chosen was that the first incident of covid-19 case in India was reported on 30th January 2020. To mitigate the negative externalities caused by pandemic, subsequent lockdowns were imposed in India during 2020 and 2021. In this backdrop, we believe by taking this time period we can capture the impact of demand shock on the large, mid and small cap companies. To analyze the rate at which the effect of shock would dissipate we have used Generalized Auto Regressive Conditional Heteroskedasticity model.

Generalized Auto Regressive Conditional Heteroskedasticity (GARCH) Model: GARCH models are advanced variants of ARCH models. GARCH models helps us to model conditional variance as an ARMA process. In GARCH models autoregressive and moving average components are incorporated in heteroskedastic variance. By incorporating them, GARCH model provide a parsimonious alternative to high order ARCH models. GARCH (p,q) models can be represented through the following equations:

$$y_t = \theta_0 + \theta_1 y_{t-1} + \dots + \theta_n y_{t-n} + \epsilon_t \tag{1}$$

$$\epsilon_t | I_{t-1} \sim N(0, h_t) \tag{2}$$

where

$$h_t = \alpha_0 + \sum_{i=1}^q \alpha_i \epsilon_{t-1}^2 + \sum_{i=1}^p \beta_i h_{t-i} \quad (3)$$

And satisfies:

$\alpha_0 > 0, \alpha_j > 0$ and $\beta_i > 0$: to guarantee positive variance.

$0 \leq \sum_{i=1}^q \alpha_i + \sum_{i=1}^p \beta_i < 1$: to have a decaying variance.

Rate at which shock decays shall be given through the following equation: $1 - \alpha - \beta$

Before running GARCH models, we have to ensure that, the univariate series that we have taken into consideration is stationary at level. To evaluate the same, we have used Augmented Dickey Fuller test. After checking for stationarity, through using ordinary least squares, we have constructed ARMA equation. If heteroskedasticity was found in the model, then we could go for GARCH (1,1) model.

Residual Diagnostics: To ensure that our GARCH model is stable, we need to ensure that our model is not suffering from heteroskedasticity. For testing the same, we have used ARCH test for which H_0 is that there are no existing ARCH effects up to the specified lag and H_1 is that there are ARCH effects. Hence, if we do not have enough evidence to reject our null hypothesis, it means that our model is not suffering from heteroskedasticity. Furthermore, if Durbin Watson statistic is close to zero, it means that our model is not plagued by the problem of auto correlation.

Descriptive Analysis: Given the glaring gap between what the academia is offering and what industry expects, on the job training is needed independent of the size of the firms. The unique ways which have been adopted by companies belonging to large cap, mod cap and small cap enterprises to tackle the same are as follows:

i) On the job training strategy adopted by large cap companies:

Large cap companies are well established businesses which have market share of more than 20,000 crore rupees. These are stable and dominant companies. Training strategies adopted by dominant companies are illustrated with the help of Infosys and Wipro.

Infosys: Infosys has a comprehensive well-grounded training center for its new recruits in Mysore. As of now Infosys Global Education Center is the largest training facility in the world. Offering internship for students as well as for employees to create C-suite leaders, Infosys offers 45 variants of new technology streams, spanning over Mainframe, Open systems, java, Microsoft, Big Data Analytics and the like. With 13,500 graduates trained in a batch, 45 variants of new age technology courses on offer and 350+ trainers, the skill development program offered by Infosys is one of the best in Industry.

Wipro: Wipro has a unique method of grooming its employees. According to Project Engineer at Wipro. “Wipro is a service-based company which normally hires from tier 3 engineering colleges. Once the student is selected the student must complete java module for which trainer and material shall be provided by Wipro. After 3 months orientation, a test is given by Wipro which needs to be cleared by the candidates with more than 70 percent. After that Wipro shall allow them to work in projects. To develop specialization in the chosen domain of working, Wipro has created a lock in period of 3 years. Even if a candidate happens to be a fast learner,

if he wants to change the domain of his work, then permission from the higher management is required.”

Other renowned large cap companies have similar training programs. Although, structuring of the programming may slightly differ, but quantum of investment and quality enhancement of their employees is par excellence.

ii) On the job training strategy adopted by mid cap Companies:

Mid Cap Companies are those companies which have a market cap which would range from 5000 crores to 20,000 crores. Mid cap companies lack the resource base and economies of scale enjoyed by large cap companies. So, the quality and nature of their training fails to match the high standards set by the large cap companies. For instance, training strategies adopted by mid cap companies like Mindtree, and Bharat Heavy Electricals Limited (BHEL) are as follows:

Mindtree: Mindtree is a tech-based technology services and consultancy company. The company understanding the need for regular on the job training has offered shot classes for sales associates through mobile based training platform based on self-learning model.

Bharat Heavy Electricals Limited (BHEL): is the largest engineering enterprise of its kind in India, catering to the needs of core sectors of the economy like power, transportation, defense, railways, renewable energy and the like. To ensure that its staff are updated with the technological advancements unfolding in their domain, BHEL has created a system wherein each of its employee receive at least 15 days of training in a year to upgrade his skills.

iii) On the job training strategy adopted by small cap companies in India:

Companies which have market capitalisation of less than 5000 crores are regarded as Small Cap companies. These companies, although are smaller in size have significant growth potential. The training strategies adopted by these companies are illustrated with the help of Bajaj Electricals and BEML.

Bajaj Electricals: has initiated the following five programmes to augment the skills and efficiency of their employees: i) Anugam: An indepth corporate induction programme; ii) Sukark : designed to create collaborative intervention among employees to gain practical experience ; iii) Design Failure Mode and Effects Analysis: which is designed to run under the guidance of industry experts so as to enhance quality assurance; iv) Pygmalion: A continued learning intervention designed to enhance the effectiveness of high potential employees.

Bharat Earth Movers Limited: Even BEML has a comprehensive on the job training programme spanning 18 months for upgrading the skill set of unskilled permanent employees. Even the contract workers with VIII/ SSLC qualifications who perform menial jobs are put through 3 month training programme. To enhance the skill set of Engineers working in production and research and development BEML has established a tie up with IIT Madras and IIT Kharagpur.

Overall inference from descriptive analysis: The quantum and quality of training given by large cap companies is far superior than that imparted by small and mid cap companies. On the other hand, the quality and quantum of training provided by small and mid cap company doesn't seem to vary much.

Empirical Results:

i) Large Cap Companies: The mean and variance equation for the large cap companies Cap companies spanning from January 2020 to December 2021 (497 observations) are presented in Table 1.

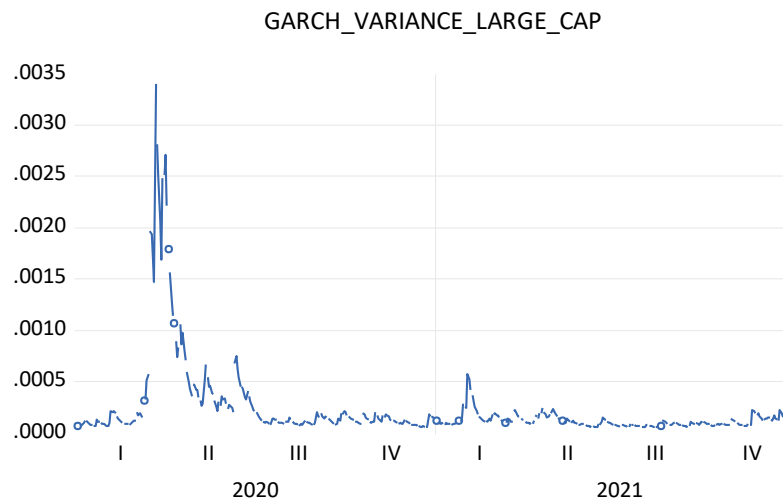
Table 1: Mean and Variance Equation of Large Cap Companies

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.001550	0.000424	3.658905	0.0003
AR(1)	-0.736643	0.399651	-1.843214	0.0653
MA(1)	0.720293	0.412126	1.747749	0.0805
Variance Equation				
C	8.57E-06	3.83E-06	2.238544	0.0252
RESID(-1)^2	0.152673	0.044044	3.466382	0.0005
GARCH(-1)	0.800944	0.053983	14.83701	0.0000
GED PARAMETER	1.242078	0.109246	11.36957	0.0000

From the above table we can see that, all the variables in Variance equation are significant. Through variance equation, we can estimate the speed of dissipation of shock in large cap companies, which is found to be $1-(0.80+0.15) = 0.05$ units per time period. Thus, in large cap companies it is going to take 24.85 days for the shock to dissipate.

The GARCH variance for large cap companies is represented in Diagram 1.

Diagram 1: GARCH Variance of large cap companies



ii) Mid Cap Companies: The mean and variance Equation of Mid Cap companies spanning from January 2020 to December 2021 (487 observations) is summarized in table 2:

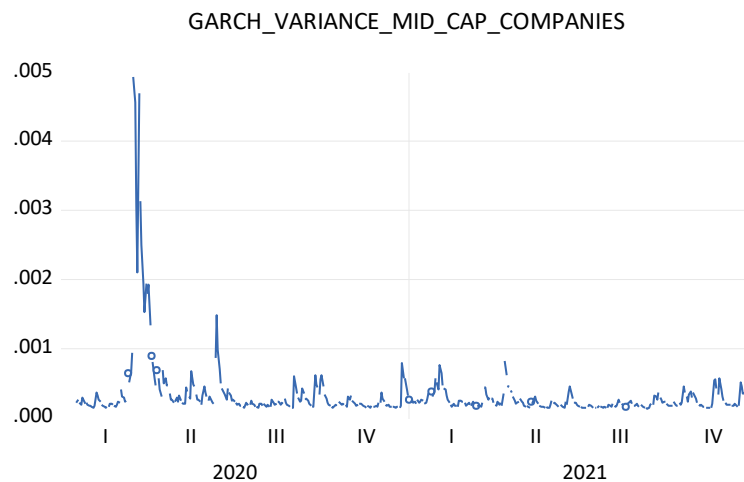
Table 2: Mean and Variance Equation of Mid cap Companies

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.002164	0.000600	3.608152	0.0003
AR(10)	-0.748548	0.057269	-13.07083	0.0000
MA(10)	0.692135	0.059683	11.59692	0.0000
Variance Equation				
C	4.46E-05	1.69E-05	2.629984	0.0085
RESID(-1)^2	0.217722	0.063073	3.451937	0.0006
GARCH(-1)	0.630397	0.100778	6.255331	0.0000
GED PARAMETER	1.318871	0.105824	12.46283	0.0000

From Table 2, we can infer that all the variables of mean, and variance equation of midcap companies are statistically significant. Furthermore, the rate at which the shock dissipates is $1 - (0.21 + 0.63) = 0.16$ units per time period. Since, the observations that we have taken into consideration are 487, the time taken for the shock to dissipate in mid cap companies is 77 days.

The GARCH variance of mid cap companies is represented in diagram 2.

Diagram 2: GARCH Variance of Mid cap companies



iii) Small Cap Companies: The mean and variance equation of small cap companies based on the data spanning from January 2020 to December 2021 (489 Observations) are summarized in Table 3.

Table 3: Mean and Variance Equation of Small cap Companies

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.002898	0.000643	4.508265	0.0000
AR(8)	-0.779711	0.090864	-8.581052	0.0000
MA(8)	0.764840	0.094544	8.089806	0.0000
Variance Equation				
C	3.24E-05	8.75E-06	3.701046	0.0002
RESID(-1)^2	0.191399	0.043842	4.365670	0.0000
GARCH(-1)	0.682192	0.064288	10.61143	0.0000

In table 3, we can observe that, in mean and variance equations, all the variables are statistically significant. We can also observe that the variance equation satisfies both the necessary

conditions, that is the coefficients of all the variables in variance equation is positive and sum of $0 \leq \sum_{i=1}^n \alpha_i + \sum_{i=1}^n \beta_i < 1$. Thus, the speed at which the adverse demand shock caused by the advent of pandemic is going to dissipate in small cap companies is $1 - (0.68 + 0.19) = 0.13$ units per time period. Thus, small cap companies are going to take 63.57 days to overcome the demand shock. The GARCH variance of small cap companies is shown in Diagram 3.

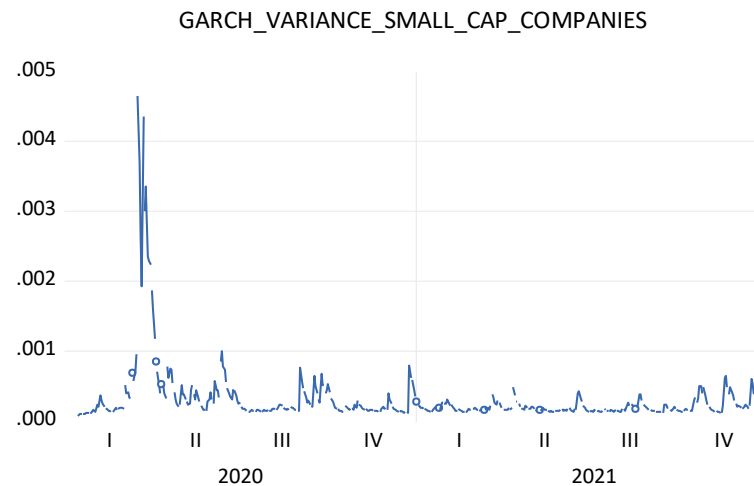


Diagram 3: GARCH Variance of Small Cap Companies

Inferences and Economic rationale: From our empirical results we found that large cap companies are able to revert to mean at the fastest pace, that is, within 25 days. When we look at mid cap and small cap companies, they are taking 77 and 64 days respectively. Given the legacy, experience, vast resource base along with quantum of investment that the large companies invest on human capital formation, large cap companies recovering from the shock at faster pace was on expected lines. What seems to be interesting is that, the speed of recovery among small companies (64 days) is higher than the speed of recovery among mid cap companies (77 days). This requires economic justification.

Economic justification of our results can be found in Law of Variable Proportions and Law of Returns to scale. Large Companies invariably enjoy economies of scale and they are able to give best in class training for their employees. Case in point is Infosys Training Centre set up by Infosys which is regarded as one of the best training facilities in the world. Large Cap Companies are also able to continuously prolonge the offsetting of law of diminishing returns by continuously upgrading their technology. This naturally enables them to remain best in class.

Now the natural question which would arise is, why mid cap companies recover at a slightly slower rate as compared to small cap companies, when mid cap companies have slightly higher resource base. The answer is to be found in the stage that these firms are operating in. Small Cap companies with their immense growth potential are operating in Law of increasing returns, which enables them to get better returns on their investment. Hence they are in a position to recover faster than Mid cap companies. Mid cap companies neither enjoy the increasing returns of small companies nor have access to vast resource base of large companies. Hence their speed of recovery is slightly slower than small cap companies.

Conclusion: Employees are the driving force behind the success or failure of an enterprise. The resilience of any enterprise is in proportion to the skill set possessed by its employees. Independent of the size and structure of the firm, on the job training has become an

indispensable part of all the industries. This is more so true in case of India, wherein there is a significant gap between academia and Industry. Through our empirical analysis, we can ascertain that, quality human resource can play a significant role in enhancing the resilience and efficacy of any enterprise. To smoothen the transition between graduates to employees, there must be active collaboration between industry and academia in making the syllabus. In addition to it, a conducive environment must be created by the Government to enable prominent private players to actively fund research in higher educational institutions. Creating industry academia partnership is going to go a long way in enhancing the resilience, efficacy and efficiency of Indian economy as a whole.

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