

Attrition of IT Workers in the Context of Offshore Outsourcing: The Economic Impact of Training

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Introduction and Motivation

The turnover of IT workers within MIS organizations of firms has long attracted research attention (Igbaria and Greenhaus 1992., Moore 2000a, Thatcher et al. 2002) as replacing IS workers is costly. The focus of the extant research has been on explaining the turnover intentions of IS professionals with a variety of factors playing a significant role. These include job satisfaction, work exhaustion, fairness of rewards, and more recently life-career goal frustration (McKnight, Setia and Sambamurthy 2008). This study examines IT worker attrition in the context of offshore outsourcing. IS professionals working within business firms primarily seek to contribute to their firm's effective leverage of IT. They are motivated to make strong internal contributions, but do not typically contribute directly to revenue and are often considered to be cost centers. In contrast IS professionals working in an offshore outsourcing context, such as in the Indian IT/ITeS industry, are evaluated primarily on their ability to generate revenue. This difference in orientation calls for a closer look at factors influencing attrition and how it can be managed in the offshoring context.

High attrition levels have a negative influence on firms' ability to service overseas clients effectively. When an employee leaves, an offshore IT firm must incur several kinds of costs to make up for her move. To begin with the firm must incur a cost of hiring to find a suitable replacement. Once the new employee is hired, she cannot be expected to be as productive as her predecessor since she has not yet learnt the nuances of the job, nor is she informed about the offshore client specific relationships. Thus, there is an opportunity cost of losing an employee. Finally, in order to make the new hire more productive the firm may have to provide some combination of technical, domain and process oriented training, all of which are an expensive proposition. Continuous and high levels of employee churn results in a low levels of firm specific knowledge and constrains sustainable organic growth for the firm.

It is important to point out the sharp increases in training investments by Indian IT firms. For instance, the bellwether company, Infosys, has been increasing training expenditure by close to 16% per annum per employee¹ over the last five years. More broadly, survey studies by Price Water House Coopers² and the Center for IT and the Networked Economy at the Indian School of Business³ show that IT firms are increasing investments in training and they believe that controlling attrition is one of the most important reasons to spend on training. Yet, there has been precious little academic focus on rigorously measuring the effectiveness of such training on factors such as attrition and employee productivity. In this study we limit our attention to the analysis of attrition. Part of the challenge in making an identifying link between practices

¹ Infosys annual reports from year 2002 to 2007

² Available at <http://www.pwc.com/extweb/pwcpublishations.nsf/docid/2711a28073ec82238525706c001eaec4>

³ Forthcoming industry report on *Human Capital Issues Facing the Indian IT/ITeS Industry*, 2008.

such as training and dependent variables such as attrition is the presence of significant potential omitted variable bias in the form of unobserved firm characteristics such as managerial culture and empathy.

Given this environment and given the importance of training as a lever to mitigate attrition our specific research questions, set in the context of offshore outsourcing are:

- a) Can we identify the impact of training investments made by IT firms on managing attrition levels?
- b) Are there significant differences in attrition across locations and by seniority of employees?
- c) Does the organizational structure play a role in influencing IT worker attrition?

Based on a dataset of 40 firms, we exploit exogenous variation in training investments across seniority levels of employees and a difference in difference based econometric estimation approach to identify a significant negative relationship between training investments and attrition. We also find that there exist significant variations in attrition across three of the four major Indian IT hubs, as well as significant variations in attrition across employee levels and organizational structure.

Background and Conceptual Model

Our study falls under the literature on developing appropriate human resource practices for IT. One stream of papers in this literature focuses on compensation schemes. Levina and Xin 2007 study the factors effecting differences in IT worker compensation across countries. Others like Mithas and Krishnan 2008 and Ang et. al. 2002 study the impact of education and skills and also find that there is moderating effect of institutional differences like IT intensive industries. Slaughter et. al. 2007 find that compensation has a temporal dimension and increases at an increasing rate for professionals in higher firm specific human capital IT jobs. This effect is reversed in lower firm specific human capital IT jobs. Breshnan et. al. empirically find that IT use, new work organizations and new products and services are increasing demand for more skilled IT labor. This increasing demand in the labor market makes it difficult to replace workers and so it is imperative for the firms to effectively retain their IT workers. Ferrat et. al. 2005 found an interesting link between turnover rates of workers and human resource management configurations of firms. Firms with a human capital focus faced lower attrition rates than firms with task focused configurations.

The high level of attrition⁴ in the Indian IT/ITeS industry is well documented in the popular press and is emphasized in a variety of industry reports. It is also reflected in the double digit wage increases that the industry has experienced in the last eight years. Not surprisingly, human capital issues ranging from managing attrition to dealing with low employability of college graduates, as well as deficits in soft-skills serve as severe constraints to the soaring ambitions of this industry. In order to manage the attrition problem IT firms must adopt certain

⁴ The industry consensus appears to be around 20% as per <http://www.indiaattritionstudy.com>

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levers that can help control the high rates of attrition (Horwitz et. al. 2003). Previous research focusing on different industries is helpful in this regard. It points out the attrition is effected by the attractiveness of the current job and the availability of alternatives (Hulin et.al. 1985). The management literature (Shaw et al. 1998) has established that in addition to increasing financial incentives and job stability, the role of employer funded professional development and training is significant and positive in mitigating employee attrition. While their study was conducted in the context of the US trucking industry, there has been scant attention to the effectiveness of the various levers for controlling attrition of IT workers. Studying this phenomenon in the context of a fast growing emerging market that is tightly coupled to the global consumption of IT products and services provides the opportunity to make insightful contributions to this stream of literature. We hypothesize:

H1: Increase in spending on training per employee reduces attrition rate

Features specific to the type of the organization may also have a role to play in making a particular job more or less attractive. Of late, researchers have shown that corporate hierarchies have been breaking down and the organization structure of the firms is flattening (Rajan 2006). It is possible that these changes may also have an impact on the attrition rate since knowledge workers may prefer a less hierarchical organization.

H2: Attrition rate decreases as the organizational structure becomes more flat

Any analysis of attrition must also consider location specific effects. Zaheer et al. 2008 highlight the importance of location in explaining firm entry in the context of the Indian IT/ITeS industry. Thus, attractive outside opportunities make it easier for employees to get alternative jobs. Consequently, firms located in places with more opportunities may get hit by high attrition rates.

H3: Locations with more outside opportunities have higher attrition.

H1 and H2 are based on the observation that training and a flat organizational structure increase the attractiveness of the job for IT workers while H3 espouses that if outside opportunities are easier to get, employees will make use of these opportunities to quit their jobs more often.

In summary, while some initial guidelines are available for IT firms to control their attrition rates, there is lack of a systematic econometric study that establishes whether the levers that had an impact on attrition in the context of other industries carry weight in the IT industry as well. Further, there is no evidence of the relative effectiveness and economic significance of these levers in controlling attrition in the IT industry. This paper attempts to answer both these sets of questions. It also complements the previous survey based IS research that explained intentions of employee attrition. Our analysis is based on archival data of attrition from HR records as well as actual training investments. Thus, by using primarily economic variables in our analysis, we are able to estimate the marginal impacts in dollars of factors, such as training, that have previously been tested against ordinal perceptual beliefs.

Description of the Data

In order to test our hypotheses, we analyzed a data set containing information about 40 IT product firms in India. This data set is fairly granular and contains information about the location of the firm, numbers of employees at junior, middle and senior levels, training expense incurred for each level of the employees, the revenues earned by the firms and the percentage of employees who left the firm at each seniority level. In addition, we also have information about the cost incurred to hire new employees at each seniority level. In our regression models, we use the percentage of employees leaving the firm as the dependent variable. The independent variables include training per employee at each level and the degree of flatness of the organization which is captured through the ratio of the senior employees to the sum of the middle and junior level employees. Further, we use two dummy variables to capture the three seniority levels and three dummy variables to capture the four different locations represented in the sample.

The data is summarized in Table 1.

| | | | | | | | | | | |
|--|---|----|-------|-------|-------|-------|-------|-------|-------|--------|
| Percent Attrition | 1 | 40 | 7% | 1% | 4% | 2% | 5% | 7% | 10% | 20% |
| | 2 | 40 | 6% | 0% | 3% | 1% | 3% | 5% | 8% | 14% |
| | 3 | 40 | 3% | 0% | 2% | 1% | 2% | 2% | 3% | 8% |
| Training Investment Per FTE (Rs 10k) | 1 | 40 | 1.113 | 0.180 | 1.139 | 0.000 | 0.631 | 0.865 | 1.213 | 6.599 |
| | 2 | 40 | 1.944 | 0.329 | 2.080 | 0.000 | 0.715 | 1.125 | 2.039 | 9.091 |
| | 3 | 40 | 4.503 | 0.891 | 5.635 | 0.000 | 0.773 | 1.554 | 6.673 | 25.000 |
| Organizational Flatness (Ratio of senior to middle plus junior employees) | | 40 | 0.121 | 0.012 | 0.073 | 0.020 | 0.075 | 0.099 | 0.177 | 0.345 |

Table 1: Summary Statistics of Continuous Variables by Level of Employee

Figure 2 provides an exploratory view of the relationship between attrition and training. The linear trend line has a negative slope, but one has to be cautious to identify a relationship at this stage because of the presence of potential unobservable omitted variable bias due to firm characteristics such as organizational culture and managerial style.

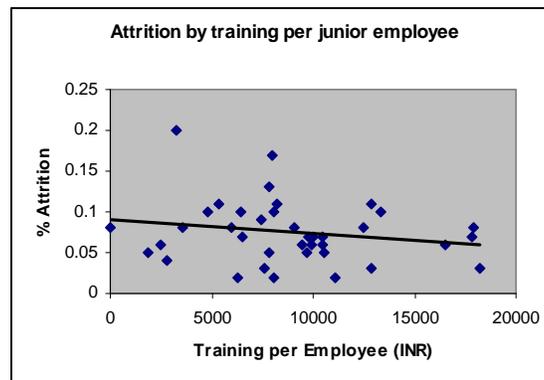


Figure 1 – Scatterplot of Percent Attrition with Training Exhibits a Negative Trend

Analysis and Results

Figure 2 represents our conceptual model through which we wish to test our hypothesis. Our main econometric challenge is to account for the unobservable firm characteristics. We do this by exploiting the differences in training investments at the firm level as a function of the seniority of the employee. This allows us to estimate a difference in difference random effects model that washes out firm characteristics such as managerial style, culture and empathy, much like how a panel structure would do if we had multi-year data.

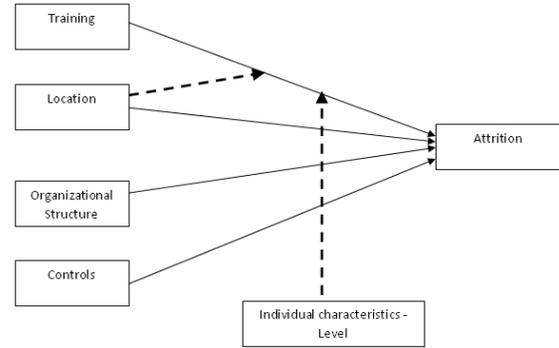


Table 2 presents the results from our initial analysis.

| Percent Attrition | Coef. | Std. Error | z | P>z | [95% Conf. Interval] | |
|---|------------|------------|-------|-------|----------------------|----------|
| Training Investment (TPFTE) Per FTE (Rs 10k) | -0.00596 | 0.00322 | -1.85 | 0.064 | -0.01227 | 0.000351 |
| Level Middle (LM) | -0.020021 | 0.006563 | -3.05 | 0.002 | -0.03288 | -0.00716 |
| Level Senior (LS) | -0.0511796 | 0.006392 | -8.01 | 0 | -0.06371 | -0.03865 |
| LM*TPFTE | 4.06E-07 | 3.57E-07 | 1.14 | 0.256 | -2.94E-07 | 1.11E-06 |
| LS*TPFTE | 4.85E-07 | 3.23E-07 | 1.5 | 0.133 | -1.48E-07 | 1.12E-06 |
| City1 | -0.0266023 | 0.010619 | -2.51 | 0.012 | -0.04742 | -0.00579 |
| City2 | 0.0151049 | 0.015475 | 0.98 | 0.329 | -0.01523 | 0.045435 |
| City3 | 0.028123 | 0.012109 | 2.32 | 0.02 | 0.00439 | 0.051856 |
| City1*TPFTE | 1.86E-07 | 1.47E-07 | 1.27 | 0.205 | -1.02E-07 | 4.73E-07 |
| City2*TPFTE | -1.34E-07 | 3.28E-07 | -0.41 | 0.683 | -7.76E-07 | 5.08E-07 |
| City3*TPFTE | -1.35E-07 | 1.52E-07 | -0.89 | 0.373 | -4.33E-07 | 1.63E-07 |
| OrgStructureRatio | -0.1053768 | 0.054714 | -1.93 | 0.054 | -0.21261 | 0.00186 |
| _cons | 0.0936759 | 0.010336 | 9.06 | 0 | 0.073417 | 0.113935 |

Table 2: A Rs 10k Increase in Training per FTE reduces Firm's Attrition Rate by 0.6%

The fitted model has a R² of 50.7%. We find that training investments do play a significant role in mitigating attrition in our dataset of 40 Indian IT firms. The economic significance of our 0.6% reduction in percent attrition for Rs 10k increase in training spending per employee estimate has to be viewed as being conservative. It has to be weighed in conjunction with firm's cost of hiring new employees as well as the loss of tacit knowledge that walks away with the departure of the knowledge worker. From an estimation perspective we find that the use of the random effects model is important. The p value indicates that close to 47% of the overall variation is due to unobservable firm specific effects, thus washing that out is critical.

Through the significance of the dummy variables we observe significant differences in attrition rates as a function of location and employee level. We also find that the organization hierarchy matter and that if the ratio of senior to middle and junior employee increases, ie firms get less hierarchical attrition decrease.

We hope to discuss these and other findings at the conference.

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