Determinants of Vacancies for Management Graduates in Indian Firms

Ashutosh Bishnu Murti &Bino Paul GD

In contrast to the vast literature on unemployment, not much is known about vacancies in developing economies such as India. We observe discernible inter-firm differences in the firm recruitment behavior. We explore the determinants of vacancy in Indian firms among management graduates. Using uni-variate and bi-variate patterns, we fit a model that posits vacancy as a function of year of existence, per cent of management graduates, organization type, skill gap and off the job training. Using a probit model, we estimate chances of vacancies as a function of years of existence, percentage of management graduates, organization type, skill-gap and off the job training.

AshutoshBishnu Murti (E-mail:murti.ashutosh @gmail.com) **& *Bino Paul GD*** (E-mail: bino paul@gmail.com) are from School of Management & Labor Studies, Tata Institute of Social Sciences, Mumbai

Introduction

To understand the determinants of vacancies[1], it is important to understand supply of job opportunities in a labor market. To understand supply of job opportunities, it is a noteworthy idea to explore why certain job seekers are unable to secure employment in the job market. Interestingly, job opportunities are prevailing despite growth in unemployment. The evidence of mismatch between job seekers and job opportunities with reference to skills and competencies of the unemployed can explain the prevailing job opportunities despite growth in unemployment. Quite importantly, it could indicate problems with the operation of the labor market in terms of allocating workforce to jobs and jobs to workforce– for example poor individual job search effectiveness and/or failures in the recruitment strategies of companies. Explanations for the coexistence of vacancies and unemployment include temporal misallocations arising through sluggish adjustment and change especially in pe-

[1] A recent prominent work by Haskel and Martine (2001) examines the propensity for firms to have skill shortage and hard-to-fill vacancies, as well as recruitment difficulties.

riods of rapid firm expansion, which may be intensified by more macro-based persistence effects in unemployment, occupational or demographic immobility - perhaps related to local costs, relative wages and rigidities associated with housing ownership and prices, high reservation wages amongst the unemployed relative to the employment opportunities available, and functional differences in the demographic identification of 'local' labor markets (particularly for vacancies) especially in regions with better commuting infrastructure. Indeed, above mentioned explanations may be complementary rather than competing to examine the coexistence of 'jobs without workforce' and 'workforce without jobs'.

From a macroeconomic prospective, until very recently, the aggregate number of vacancies used to be derived from the number of vacancies which had been notified to the employment exchange (EE) by firms who contacted employment exchange for job seekers. Due to lack of data on vacancies in particular to low human development and highly populated countries such as India seem limit the scope of research on vacancies of management graduates. This paper uses data from a sample survey of 102 firms in India undertaken in 2012 to investigate the determinants of vacancies at the firm level, with focus on how these forces impact vacancies in Indian labor market.

Theory & Previous Evidence

It appears that there is very little previous research which focuses on the determinants of vacancies, particularly in the context of large developing countries such as India. In part, this is undoubtedly due to the paucity of data on vacancies. The literature on matching function and estimates of the Beveridge curve[2] typically take the number of vacancies, or the vacancy rate, autonomous of explanations that are grounded in the context of firm. In this paper, our core objective is to investigate the determinants of vacancies at the firm level. Interestingly, two decades ago, Devine & Kiefer (1991) abridged their research on labor market search as "On balance, the supply side of the labor market is well studied if not perfectly understood. The demand side is wide open…they must be supplemented by additional studies before the findings can be considered solid". Moreover, DeVaro (2005) argues that "labor economists, sociologists, psychologists, and human resource management specialists have spent the last half-century exploiting the inadequate existing data sets in an effort to learn firm's recruitment behavior".

Holzer, et al., (2006) analyze employers' hiring behavior during the tight United States (U.S.) labor markets in the 1990s. This study centers on the hiring of disadvantaged workers, like groups with criminal records, welfare recipients and short-term employed. Moreover, some of the previous studies which are similar to this paper include Haskel &

[2] Conventionally, Beveridge curves are specified with unemployment being a function of the vacancy rate (and other variables) so that the causality implicitly runs from higher (lower) vacancies leading to lower (higher) unemployment

Martin (2001)[3], Holzer(1994)[4], and Morissette & Zhang(2001)[5]. The forthcoming analysis is most closely related to that of Holzer (1994). However, a comparison between this paper and literature seems to be difficult because of discernible differences in the contexts-demography, business environment and so on. In particular, we focus on management graduates vacancy and firms who hire management graduates in Indian labor market.

Data Sources &Methodology

While this research describes determinants of vacancy, using uni-variate and bi-variates patterns, we fit a regression model that specifies vacancy as a function of the year of existence, per cent of management graduates, organization type, skill gap and off the job training. The unit of analysis is the firm that operates in India who hires management graduates at both global and local levels. First, we draw the list of firms using Captiline Database[6]. We found that firms in India are distributed unevenly across locations, concentrated in a few geographical units such as major urban agglomerations, in particular global cities (Sassen, 2001) like Mumbai, Delhi, Bangalore and Hyderabad. We chose three global cities Mumbai, Bangalore and Hyderabad. We dropped Delhi since we found having both Mumbai and Delhi may lead to saturation in the pattern that emanates from discernible similarities in business systems and labor markets. On the other hand, Hyderabad brings heterogeneity in the sample. The three cities were seen as different groups to allow proportional representation of enterprises across. After grouping, random method was employed in selecting the companies to avoid researcher's biases in the selection. The statistically acceptable sample size was determined by employing Daniel (1999)[7]method to compute the sample size. We found that a sample size of 96 firms would suffice estimation with 10% margin of error. Following this, we randomly chose firms from the list. Then,

[3] Haskel & Martin (2001) studied United Kingdom labor market

[4] Holzer (1994) studied United States labor market

[5] Morissette & Zhang (2001) studied canada labor market

[6] Capitaline Database covers more than 22,000 Indian listed and unlisted companies, classified under more than 300 industries, along with powerful analytic tools.

[7] To calculate an appropriate sample size, we apply the following formulae: $n = \frac{NZ^2(1-P)}{d^2(N-1)+Z^2(N-1)}$ and , where n delineates sample size drawn from the finite population (N), Z represents Z statistic for 95% confidence level, P is the expected proportion that we are going to calculate,d indicates precision (Daniel, 1999). It should be noted that the Z value is set at 1.96 for 95% confidence level. Interestingly, P (expected proportion) varies between 0 and 1, and the sample size is a variant of P. It is important to note that the P is taken in proportion of one, i.e., if expected proportion or prevalence is 40%, then P is equal to 0.4. Smaller d implies good precision or smaller error of estimate, and it should be in proportion to one (Naing et al, 2006). Interestingly, although there is not a precise rule to choose an appropriate d, Naing et. al (2006) show that if P is less than 10% (0.1), then d should be half of P, i.e., 0.05. On the other hand, if P is greater than 90% (0.9), d would be 0.5 (1-P). Of course, a larger or smaller d can be set depending on the availability resources. If P is between 0.1 and 0.9, then it is appropriate to choose 5% precision (0.5). In this study, P=0.5 and d=0.1., the sample size is 96.

we used two channels to collect data from firms: face-to-face interview and online web based tool[8]. Subsequently 102 interview schedules[9] were completed, majority of which were administered by face-to-face interviews. A total of 76 (74.5%) were administered by face-to-face interviews while 26 (25.5%) were completed using online survey form.

Vacancy Incidence

Table 1 is split into eight panels that depict percentage distribution of vacancy incidence. While panel A shows aggregate vacancy incidence for vacancies, skill shortage vacancy and hard-to fill vacancy remaining panels convey disaggregation of vacancy incidence with respect to city (panel B), industry (panel C), total revenue (panel D), year of existence (panel E), number of employees (panel F), percentage of management graduates (panel G) and organization type (panel H).We define vacancy incidence as the ratio of percentage of responses that report there exists vacancies in the firm with respect to a unit of disaggregation (city, industry, total revenue, years of existence, number of employees, per cent of management graduates and organization type (v_i / x_i) to frequency of unit of disaggregation as a percentage of total sample size $(x_i / \sum_i^n x_i)$

$$V_i = \frac{v_i / x_i}{(x_i / \sum_i^n x_i)} \times 100;$$

V_i = vacancy incidence for i^{th}unit of disaggregation,

v_i= Responses that report there exist vacancies in the firm with respect to a unit of disaggregation

x_i=frequency of i^{th} unit of disaggregation

$\sum_{ii}^{n} x$ = total sample size

Units of disaggregation = {city, industry, total revenue, years of existence, number of employees, per cent of management graduates and organization type}

Skill shortage vacancies (SSVs) have been defined as those caused by a low number of applicants with the required skills or work experience or qualifications. We look further at the range of reasons explaining hard-to-fill vacancy (HtFVs), including those not related to skills issues and also examine the balance within SSVs between lack of skills, qualifications and experience.

As shown in Panel A of Table 1, vacancy incidence varies in the range of 57 per cent (hard-to-fill) to 82 per cent (vacancies). In panel B, the whole sample is disaggregated for cities. Across type of vacancies, Hyderabad reports highest incidence (69 per cent to 92 per cent) while Bangalore reports the least (53 per cent to 71 per cent). Panel C presents

[8] We executed web based tool to 25 per cent of sample since respondents sought if web could be an option to respond.

[9] For face to face interview,an interview schedule was used and parallel to schedule, an online tool was developed.

Table 1 Vacancy Incidence: Proportion Reporting Vacancies by Firm *(n*=102)*

		Vacancy Incidence (%)		
		Vacancies	Skill Shortage	Hard to fill
Panel A	Aggregate	82.3	64.7	56.8
Panel B city	Mumbai	86.8	60.5	52.6
	Hyderabad	92.3	88.5	69.2
	Bangalore	71.1	52.6	52.6
Panel C Industry	Management Consulting	84.5	61.5	53.8
	Manufacturing	72.7	63.7	45.4
	Information Technology	89.5	73.7	57.9
	Financial Services	84.5	61.5	61.5
	FMCG	88.9	55.6	55.6
	Construction	100	71.4	71.4
	Pharmaceuticals	66.7	66.7	66.7
	Others	75	62.5	62.5
Panel D Total	< 100 Crore	66.7	76.2	76.2
Revenue (Rs.)	100 - 499 Crore	80	65	50
	500 - 999 Crore	83.3	55.5	50
	> 1000 Crore	90.7	62.8	53.5
Panel E Year of	0 - 5 Years	56.2	68.7	56.2
Existence	6 - 10 Years	82.6	43.5	52.2
	11 - 15 Years	85	85	75.0
	15 Years and Over	90.7	65.1	51.2
Panel F Number	< 50 Employees	100	42.9	71.4
of Employees	50 - 500 Employees	59.4	65.6	50
	500 - 999 Employees	100	72	64
	>1000 Employees	86.8	63.2	55.3
Panel G % of	Less than 10%	76	65.3	53.3
Management	Not less than 10%	100	63	66.7
Graduates				
Panel H Organisation	Private Company	75.4	63.9	55.7
Type	Public Listed Company	93.8	65.6	53.1
	Any Other	88.9	66.7	77.8

Source: Computation based on Appendix B
*n represents the total number of sample firms

industry wise vacancy incidence, disaggregating the sample into eight categories. For the stream hard-to-fill, incidence varies across industries, in the range of 45 per cent (manufacturing) to 71 per cent (construction). The vacancy incidence for skill shortage varies between 56 per cent (Fast Moving Consumer Goods (FMCG) and 74 per cent (Information Technology). The range for the category vacancies is 67 per cent (pharmaceuticals) to 100 per cent (construction). In panel D, vacancy incidence is computed with respect to four categories of total revenue. The vacancy incidence for hard-to-fill is the highest for the lowest tire of total revenue (less than Rs. 100 crores) while this indicator is lowest for the highest tire (at least Rs. 1000 crores). Exactly reverse pattern is

valid for the category's vacancies (91 per cent for highest tire and 67per cent for lowest tire). However, for the stream skill shortage, incidence varies in the range of 56 per cent (Rs.500 crore to Rs.999 crore) to 76 per cent (less than Rs.100 crore). Year of existence, split into four categories, forms the base for panel E. While skill shortage and hard-to-fill report similar order – highest for 11 to 15 years and lowest for 6 to 10 years, incidence varies between 56 per cent (0 to 5 years) and 91 per cent (15 years and above) for vacancies. In Panel F, the data is disaggregated with respect to four categories that represent number of employees. For hard-to-fill, incidence varies in the range of 50 per cent (50 to 500 employees) and 71 per cent (less than 50 employees). The range of this indicator, for skill shortage, varies between 43 per cent (less than 50 employees) and 73 per cent (500 to 999 employees). As regards vacancies, two categories - less than 50 employees and 500 to 999 employees – report 100 per cent apiece. Panel G presents a binary classification of percentage of management graduates in total workforce - less than 10 per cent and not less than 10 per cent. While vacancies and hard-to-fill report similar order (the category more than 10 per cent management graduates reporting highest percentage), skill shortage reports a reverse pattern. The variable 'organization type' forms panel H, classified into three. For hard-to-fill, incidence varies between 53 per cent (public listed company) and 78 per cent (any other). As regards skill shortage, the range appears to be very thin. For vacancies, the indicator varies between 75 per cent (private limited company) and 94 per cent (public listed company).

Quite important, labor markets irrespective of macroeconomic condition tend to have vacancies at one point in time as employees quit voluntarily (MacKay & Jones, 1989). For instance, based on 5500 firms in New Zealand, Mason, et al., (2010) observed that 76.6 per cent of the firms had vacancies, 47.9 per cent hard-to-fill vacancies and 35.7 skill shortage vacancies during the previous year. Interestingly, the corresponding pattern for the present study is 82 per cent of the firms had vacancies, 65 per cent had skill shortage vacancies and 57 per cent had hard-to-fill vacancies in the previous year.

The Determinants of Vacancies

What determines chances of vacancies in firms can be viewed from three different angles, including vacancies seen as a matching process and outcome, relating vacancies with micro and local labor market phenomena such as unemployment, and linking vacancies with firm characteristics. Literature is rich on the first two streams while the third approach appears to be scarcely explored. Drawing cues from Table 1 that outline incidence rates with respect to type of vacancies, taking vacancy in general sense that subsume both hard to fill and skill shortage vacancies, we explore whether firm characteristics impact chances to have vacancies for management graduates. We apply a simple heuristics of whether a given variable appears to be the reason for variation in incidence rates

and that variable ought not to have too many categories considering that our sample size is thin to include in the model. Moreover, we chose a specification that does not get mired in covariance between the independent variables. Given this backdrop, we specify the dependent variable whether firm had vacancy for management graduates in the last year as a function of independent variables-years of existence, per cent of management graduates, organization type, skill gap and off-the-job training.

We use a binary scale to measure the dependent variable, coding 1 if there was at least one vacancy for management graduates at the firm and 0 otherwise. The first independent variable years of existence may be construed as an indicator that captures sustained business by maintaining relatively larger scale in terms of number of employees. As shown in Appendix A, there appears to be discernibly higher convergence between years of existence, number of employees, and revenue, generating prospect for multi-collinearity[10] if we have all these three variables in our model. Therefore we retain only years of existence. This variable, originally measured in a continuous scale, is transformed into a categorical scale: 0-5 years of existence, 6 to 10 years of existence, 11 to 15 years of existence, and 15 and above years of existence. The second variable, percentage of management graduates in total employment is measured in a binary scale: not more than 10 per cent (73 per cent of total sample) is coded 1 and 0 otherwise. We set 10 per cent as a cut-off to form categories since workers per manager ratio hovers around 10[11], in particular in Indian organized manufacturing sector. The third variable organization type, too, is measured in a binary scale: private limited (60 per cent of total sample) is coded 1 and 0 otherwise. The fourth variable is skill gap, measured in a binary scale: 1 represent skill gap exists and 0 otherwise. The fifth variable is off-the-job training, another binary variable that codes 1 for having off-the-job training and 0 otherwise.

We fit a probit model to estimate this function. Table 2 reveals a number of interesting patterns and findings. Compared to the group of firms having lowest duration of existence (0-5 years), chances of having a vacancy for management graduates are higher for categories having higher year of existence. This pattern may have roots in economies of scale and issues relating to cost of coordination[12] since we found most of the (two-thirds) firms that have been existing more than 15 years operate on a large scale, employing more than 1000 workers, presumably these firms require to

[10] Multicollinearity is a statistical phenomenon in which two or more predictors in the model are correlated and provide redundant information about the response.

[11] Muralidharan et al. (2013) in their work "Should Wages Go-up in Indian Manufacturing?" explain ratio of supervisory and managerial staff according to National Industrial Classification (NIC) 2 digit, assuming that there was no significant technical change to impact workers per supervisory and managerial staff during1999-2008.

[12] As Gulati& Singh (1998) explain that coordination costs as those associated with activities among partners that range from decomposing tasks among members to the level of communication and decisions related to the joint accomplishment of set objectives.

Table 2 Determinant of Vacancies *(n*=102)*

Dependent Variable	Outcome
Year of Existence: reference group is 0 to 5 Years	
Year of Existence 05 to 10 year	Positive & Statically Significant at 1 per cent
Year of Existence 10 to 15 year	Positive & Statically Significant at 1 per cent
Year of Existence 15 year and above	Positive & Statically Significant at 1 per cent
Per cent of Management Graduate (0= less than 10%, 1=Not less than10%,)	Positive & Statically Significant at 1 per cent
Organization Type (0=Private limited, 1=otherwise)	Statically Not Significant
Skill Gap (0=No, 1=Yes,)	Positive & Statically Significant at1 per cent
Off the Job Training (0=No, 1=Yes,)	Negative & Statically Significant at 5 per cent

Dependent variable: Vacancy within Firm (1=Vacancy exists, 0=Otherwise)
Source: Based on Appendix C

have more managerial vacancies to minimize cost of co-ordination. Quite important, seeing the prospect of multi-collinearity between years of existence and number of employees and fit in the model, while we chose years of existence we did not consider number of employees. As per cent of management graduates is at least 10 per cent chance of vacancy rises. Perhaps this patter confirms to the hunch that as density of management graduates increases in a firm there are higher chances of creating vacancies for management graduates, something closer to the phenomenon of homophily[13].

As shown in Table 2, chances of vacancy appear not to vary with type of organization. Quite clearly, as skill gap increases chances of vacancy also increases, implying that skill may be hard to replicate through cost effective ways, rather the core of skill expected to be with management graduates seem to be innate in personnel, entailing firms to create vacancies as skill shortage persist. While, firms tend to design both off-the-job training and on-the-job training to make employees more skilled, in particular in organization specific contexts, during our field work we found off the job training to be perceived as more important and strategic than on-the-job training since the latter is already embedded in the job design. Interestingly, when compared to the context of no off the job training, chances of vacancy are lower for situation with off the job training. Perhaps, viewing its strategic role off the job training may create incentives to stay in organization thereby reduce chances of vacancy. Although, we tried to estimate the model with an interactive item that is the product of skill gap and off-the-job training, that turned out to be not statistically significant.

Characteristics of firms such as size, sector and reputation may affect the attractiveness of vacancies to job seekers. Russo, et al., (1996) look at the effect of employers' characteristics and practices on the distance between employees' place of

[13] Homophily states that similar individuals associate with each other more often than others. The presence of homophily has been discovered in a vast array of network studies.

residence and work and argue that harder to fill vacancies will exhibit a greater distance. They find that large firms are associated with greater recruitment distance, whereas firms in the manufacturing sector are associated with a shorter distance.

Conclusions

In this paper we present some evidence on the determinants of management graduate vacancy at the firm level, using data from a sample survey of 102 firms in India undertaken during 2012. The paper highlights vacancy incidence, methods used to fill the vacancies, duration to fill vacancies, reason and impact of vacancies and action taken to overcome. Moreover, we find that 82 per cent of the firms had vacancies while 65 per cent of firms and 57 per cent of them report skill shortage vacancies and hard-to-fill vacancies respectively. Referencing is the highest cited method used by firm to hire management graduates as referred candidates are more likely to fit the skill profile desired by the firm (Fernandez & Weinberg, 1997).

Using a probit model, we estimated the chances of vacancies as a function of years of existence, percentage of management graduates, organization type, skill-gap and off the job training. It is evident from the probit estimate that the chance of vacancies increases with the increase in the year of existence of firm and firm with higher percentage of management graduates. The roots of this pattern can be understood from economies of scale and issues relating to cost of coordination. Kaldor (1934) concludes that perfect competition is unrealistic and a large firm is harder to manage. Indeed, Marshall (1920) argued that there were managerial economies of scale, which would aggravate the problem noted by Kaldor and Sraffa[14].Schumpeter (1950) also seems to believe in managerial economies of scale, because "monopolization may increase the sphere of influence of the better, and decrease the sphere of influence of the inferior, brains"[15].

Moreover, there is considerable variation in the distribution of vacancies, and a number of firm characteristics can be identified which are significantly associated with vacancies, much of the variation in vacancies remains unexplained. One explanation is that this is due to unobserved heterogeneity between firms. However, a more satisfactory explanation lies in the fact that aggregate vacancy inflows and outflows are so large relative to the vacancy stock -that is, there is considerable job turnover in the labor market - and this is reflected in vacancies at the firm level. Thus, it is possible to identify factors which are correlated with vacancy incidence at the firm; in general there is con-

[14] Marshall (1920:.265). In other words, we say broadly that while the part which nature plays in production shows a tendency to diminishing returns, the part which man plays shows a tendency to increasing returns. The law of increasing returns may be worded thus:- an increase of labor and capital leads generally to improved organization, which increases the efficiency of the work of labor and capital.

[15] Schumpeter (1950 :101). More recent work along these lines includes Lucas (1978) and Calvo and Wellisz (1980), who argue, that high-ability managers will go to large firms where their greater capacity to manage can be put to better use.

siderable variation in the vacancy stock across firms which cannot be accounted for. The factors which are identified as important can only account for a small proportion of the variation in vacancy rates between firms at any point in time.

References

Barron, J. M. & Bishop, J, (1985) "Extensive Search, Intensive Search, and Hiring Costs: New Evidence on Employer Hiring Activity", *Economic Inquiry*, 23 (3): 363-82.

Burdett, K. & Cunningham, E. J. (1998), "Toward a Theory of Vacancies", *Journal of Labor Economics*, 16 (3): 445-78.

Clark, J. & Jochum, V. (2008), Third Sector Skills Research 2008: Further Evidence and Recommendations on Skills Gaps, London:: UK Workforce Hub and NCVO.

Daniel, W. W. (1999), Biostatistics: A Foundation for Analysis in the Health Sciences (7th edition.), New York: John Wiley & Sons.

DeVaro, J. (2005), "Employer Recruitment Strategies and the Labor Market Outcomes of New Hires", *Economic Inquiry*, 43 (2): 263-82.

Devine, T. J. & Kiefer., N. M. (1991), Empirical Labor Economics: the Search Approach, New York: Oxford University Press.

Fernandez, R. M. & Weinberg, N. (1997), Sifting and Sorting: Personal Contacts and Hiring in a Retail Bank, *American Sociological Review, 62* (6): 883-02.

Gulati, R. & Singh, H. (1998), "The Architecture of Cooperation: Managing Coordination Costs and Appropriation Concerns in Strategic Alliances", *Administrative Science Quarterly*, 43 (4): 781-814.

Haskel, J. & Martin, C. (2001), "Technology, Wages and Skill Shortages: Evidence from UK Micro Data", *Oxford Economic Studies*, 53 (4): 642-58.

Holzer, H. J. (1994), "Black Employment Problems: New Evidence, Old Questions", *Journal of Policy Analysis and Management* , 13 (4): 699-722.

Holzer, H. J., Raphael, S. & Stoll, M. A. (2006), "Statistics Employers in the Boom: How Did the Hiring of Less-Skilled Workers Change during the 1990s"? *The Review of Economics and Statistics*,88 (2): 283-99.

Kaldor, N. (1934), "The Equilibrium of the Firm", *The Economic Journal*, 44 (173): 60-76.

MacKay, R.& Jones, D. (1989), Labor Markets in Distress: The Denial of Choice, Avebury: Gower Publishing.

Marshall, A. (1920), Principles of Economics: an Introductory Volume., New York: MacMillan

Mason, G., Mok, P., Nunns, P., Stevens, P. & Timmins, J. (2010) A Good Worker is Hard to Find: The Determinants of Skills Shortages in New Zealand Firms, nzae. katipo. co.nz.

Matlay, H. (1999), "Employee Relations in Small Firms: a Micro-Business Perspective", *Employee Relations* , 21 (3): 285-95.

Montgomery, J. D. (1991), "Social Networks and Labor-Market Outcomes: Toward an Economic Analysis", *The American Economic Review*, 81 (5): 1408-18.

Morissette, R. & Zhang, X. (2001), "Experiencing Low Income for Several Years", *Perspectives on Labor and Income*, 13 (2): 25-35.

Muralidharan, T., GD, B. P. & Murti, A. B. (2013), Should Wages Go-up in Indian Manufacturing*?*, Mumbai: Labour Market Research Facility.

Russo, G., Rietveld, P., Nijkamp, P., & Gorter, C. (1996), "Spatial Aspects of Recruitment Behavior of Firms: An Empirical Investigation", *Environment and Planning*, 28:1077-93.

Sassen, S. (2001), The Global City: New York, London, Tokio, Princeton University Press.

Van Ours, J. & Ridder, G. (1992), "Vacancies and the Recruitment of New Employees", *Journal of Labor Economics* , 138-55.

Appendix A Vacancy Incidence: Proportion Reporting Vacancies by Firm Characteristics (n*=102)

		Vacancy Incidence			
		Vacancies	Skill Shortage	Hard to fill	%
Panel A	Aggregate	82.35	64.71	56.86	
Panel B	Mumbai	32.35	22.55	19.61	37.25
Regions	Hyderabad	23.53	22.55	17.65	25.49
	Bangalore	26.47	19.61	19.61	37.25
	Total	*82.35*	*64.71*	*56.86*	*100*
Panel C Sector	Management Consulting	10.78	7.84	6.86	12.75
	Manufacturing	15.69	13.73	9.80	21.57
	Information Technology	16.67	13.73	10.78	18.63
	Financial Services	10.78	7.84	7.84	12.75
	FMCG	7.84	4.90	4.90	8.82
	Construction	6.86	4.90	4.90	6.86
	Pharmaceuticals	1.96	1.96	1.96	2.94
	Others	11.76	9.80	9.80	15.69
	Total	*82.35*	*64.71*	*56.86*	*100*
Panel D Total	< 100 Crore	13.73	15.69	15.69	20.59
Revenue Rs.	100 - 499 Crore	15.69	12.75	9.80	19.61
	500 - 999 Crore	14.71	9.80	8.82	17.65
	> 1000 Crore	38.24	26.47	22.55	42.16
	Total	*82.35*	*64.71*	*56.86*	*100*
Panel E Year of	0 - 5 Years	8.82	10.78	8.82	15.69
Existence	6 - 10 Years	18.63	9.80	11.76	22.55
	11 - 15 Years	16.67	16.67	14.71	19.61
	15 Years and Over	38.24	27.45	21.57	42.16
	Total	*82.35*	*64.71*	*56.86*	*100*
Panel F Number of	< 50 Employees	6.86	2.94	4.90	6.86
Employees	50 - 500 Employees	18.63	20.59	15.69	31.37
	500 - 999 Employees	24.51	17.65	15.69	24.51
	>1000 Employees	32.35	23.53	20.59	37.25
	Total	*82.35*	*64.71*	*56.86*	*100*
Panel G % of	Less than 10%	55.88	48.04	39.22	73.53
Management	Not less than 10%	26.47	16.67	17.65	26.47
Graduates	*Total*	*82.35*	*64.71*	*56.86*	*100*
Panel H	Private Company	45.10	38.24	33.33	59.80
Organisation	Public Listed Company	29.41	20.59	16.67	31.37
Type	Any Other	7.84	5.88	6.86	8.82
	Total	*82.35*	*64.71*	*56.86*	*100*

Source: Field Survey carried in Hyderabad, Bangalore and Mumbai in 2012
*n represents the total number of sample firms

Appendix B Number of Employees, Year of Existence and Total Revenue (n*=102)

Number of Employees			Total Revenue (In Rs.Crore)			
			< 100	100-499	500-999	> 1000
< 50	Years of	0 - 5 Years	3	0	0	0
Employees	Existence	6 - 10 Years	3	0	0	0
		15 Years and Over	1	0	0	0
		Total	7	0	0	0
50 - 500	Years of	0 - 5 Years	7	4	0	0
Employees	Existence	6 - 10 Years	0	8	2	0
		11 - 15 Years	2	1	3	0
		15 Years and Over	0	1	0	4
		Total	9	14	5	4
500 - 999 Employees	Years of Existence	6 - 10 Years	1	1	4	2
		11 - 15 Years	3	1	4	1
		15 Years and Over	0	0	3	5
		Total	4	2	11	8
>1000	Years of	0 - 5 Years	0	2	0	0
Employees	Existence	6 - 10 Years	0	0	0	2
		11 - 15 Years	0	0	1	4
		15 Years and Over	1	2	1	25
		Total	1	4	2	31
Total	Years of	0 - 5 Years	10	6	0	0
	Existence	6 - 10 Years	4	9	6	4
		11 - 15 Years	5	2	8	5
		15 Years and Over	2	3	4	34
		Total	21	20	18	43

Source: Field Survey carried in Hyderabad, Bangalore and Mumbai in 2012

*n represents the total number of sample Firms

Appendix C Probit Regression Analysis for Vacancy (n*=102)

Independent Variable	Coefficient	Robust Standard Error
Year of Existence: reference group is 0 to 5 Years		
Year of Existence 05 to 10 year	2.22***	0.64
Year of Existence 10 to 15 year	1.83***	0.52
Year of Existence 15 year and above	2.60***	0.83
More than10% Management Graduate (0=less than 10%, 1=Not less than 10%)	0.72***	0.19
Organisation Type (0=Private, 1=Otherwise)	-0.82	0.56
Skill Gap (0=No,1=Yes)	1.55***	0.59
Off the Job Training (0=No, 1=Yes)	-1.17**	0.58
Constant	-2.58	0.80
No. of Observation		102
Wald chi2(7)		28.81
Prob > chi^2		0.0002
Pseudo R^2		0.58
Log Pseudo likelihood		-19.68

Dependent variable: Vacancy within Firm (1=Vacancy exists, 0=Otherwise)

,* indicate that coefficient is statistically significant at, 5 and 1 per cent respectively

Source: Field Survey carried in Hyderabad, Bangalore and Mumbai, 2012