Economics Bulletin

Volume 39, Issue 4

Employers search: Are employee referrals effective?

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Abstract

This is the first study that utilizes the unplanned delay in recruitment to identify the effectiveness of employee referrals in firms' recruiting processes. I find that the use of referrals reduces the probability of delays in recruitment and the duration of the delay in the case that the firm chooses a small number of parallel search strategies. Therefore, employee referrals do have a beneficial effect on the recruiting process if they are used solely or in addition to very few other search strategies.

Citation: Martina Rebien, (2019) "Employers search: Are employee referrals effective?", *Economics Bulletin*, Volume 39, Issue 4, pages 2499-2506
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Submitted: August 22, 2018. **Published:** November 03, 2019.

1. Introduction

The use of employee referrals is often considered an effective way to fill a vacancy (e.g., Lindeboom *et al*. 1994, Gorter and Van Ommeren 1999), but until now, literature has provided no evidence that referrals prevent or reduce delays in recruitment. This study contributes to the scarce research on the effect of referrals on the duration of employer searches (e.g., Gorter *et al*. 1996, DeVaro 2008) and it is the first that refers to the duration of *delays* in recruitment, rather than the duration of search itself.

In general, research on firms' recruitment behaviour assumes that a long search duration is caused partly by delays in recruitment (e.g., Andrews *et al*. 2008) from which additional search costs will arise, such as opportunity costs in production or costs of worker reallocation. Such studies start from the premise that the duration of search and the effectiveness of search are negatively correlated. Nevertheless, relatively long search durations can be effective; e.g., advance knowledge of a vacancy might prolong the search duration but allow for staffing without delay because the firm can start searching in advance (Burdett and Cunningham 1998). Otherwise, short search durations can be ineffective; e.g., dropouts that are not foreseeable can cause delay even if the search duration itself is shorter, because of an immediate need for workers.

Thus, I argue that the duration of the recruiting process as a whole is not invariably adequate for identifying the effectiveness of recruiting processes. In this context, information on the unplanned delay in recruitment could be a better indicator for evaluating the effectiveness of the recruiting process. This delay is defined as the duration between the employer's scheduled point in time the hired person shall start to work to the actual point in time the person begins to work.[1]

The delay is zero in the case the actual point in time lies before or at the scheduled point in time. A zero delay should not be problematic for the firm, because the firm can employ the right person at the scheduled time.

The main obstacle in previous research was the lack of adequate data on planned and actual recruiting durations. Based on such information, I empirically assess the effectiveness of referrals in employers' recruiting processes compared with other search strategies.

First, I find a positive correlation between the use of employee referrals and the probability of a frictionless hiring in cases where firms decide to use a small number of parallel search strategies; second, I find that this also holds also true when it comes to the question of which search strategies reduce the duration of a delay in recruitment.

2. Data and Method

For the empirical analysis, I use data from the years 2010 to 2014 from the IAB Job Vacancy Survey, which is a representative survey of human resource managers and managing directors in German firms (Moczall *et al*. 2015)[2] that is stratified by Eastern and Western Germany, 23

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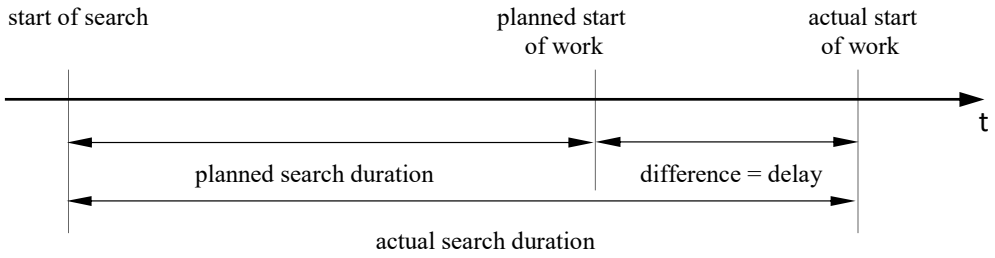
[1] This does not necessarily mean that the firm has to continue search above the scheduled search duration because sometimes firms find the right candidate in time, but have to wait until she can start working. This makes around 20 percent of all successful recruitment processes (Heckmann et al., 2013).

[2] Data of the waves 2000 to 2014 and more detailed information are available from the Research Data Centre at the IAB: http://fdz.iab.de/de/FDZ_Establishment_Data/IAB_Job_Vacancy_Survey.aspx

branches and 7 firm size classes. The questionnaire provides information on the last person hired within the past year from approximately 9,000 firms yearly. This random sample contains details on the timing of recruiting processes, search strategies by firms to find candidates and the requirements of the to-be-filled positions.

Information on the timing of the recruiting process includes the day the search started, the day that the firm intended the newly hired worker to start work and the actual day the newly hired worker started to work. With this detailed information in hand, I define delays in the staffing processes by calculating the difference between the planned and the actual date of the working start as a scale variable (figure 1). A positive difference points to a friction in recruitment, whereas no difference points to a frictionless recruitment.

Figure 1. Scheme of firms' search duration



Source: IAB Job Vacancy Survey, own representation.

I use a probit regression model to examine whether the use of referrals is negatively correlated with the probability of frictions in the recruiting process. In the case of a frictionless hiring, the dependent variable is coded 1, otherwise, it is coded 0.

To examine the quantitative relation between the use of referrals and the duration of the delay in recruitment, I use an accelerated failure time model (AFT) (see Kleinbaum and Klein 2012). This is a parametric model which describes the acceleration or deceleration of the delay as a function of different search strategies. For this purpose, the delay T is assumed to follow a distribution function$S(t) = P(T > t)$. Based on this, the AFT describes the probability S_R that a worker is found by referrals after t days is equal to the probability S_{NR} that a worker is found by other search strategies after γt days:

$$S_R = S_{NR}(\gamma t) \text{ for } t \geq 0$$

The term γ for $\gamma > 0$ ($\gamma < 0$) is called the acceleration factor (deceleration factor). The AFT allows to evaluate the effect of the predictor variables on this factor. To estimate the AFT we can write this AFT assumption in terms of random variables for the delay T, thus $\gamma T_R = T_{NR}$.

Finally, the model for the delay time T for firm i can be written as:

$$T_i = \exp(\alpha_0 + \beta_0 d_i + \mathbf{\beta_1 X_i} + \frac{1}{p}\epsilon_i) = \exp(\alpha_0) * \exp(\beta_0 d_i) * \exp(\mathbf{\beta_1 X_i}) * \exp\left(\frac{1}{p}\epsilon_i\right)$$

Where $\mathbf{X}$ is the vector of covariates, and $\frac{1}{p}\epsilon$ is the parametrization of $\sigma\epsilon$ and the parameter σ scales the error term ϵ, following a Weibull distribution. While a delay passes on, one can assume that the probability of filling the vacancy increases, which can be taken into account over the passage of time in the model.

For the construction of the dummy variable d that denotes the chosen (combinations of) search strategies, I use information on all reported search strategies a firm employs to search for candidates as explanatory variables, whether these strategies are successful or not (cf. Krug and Rebien 2012). This is in line with Mouw who argued that the finding of a candidate 'is a misleading way to determine the effectiveness of job search methods if workers use multiple methods of job search' (Mouw 2003: 870), which can also be applied for firms. However, another potential source of endogeneity is that firms choose their search strategies depending on their requirements. This issue cannot be fully solved and, therefore, the following results should not be strictly interpreted as causal effects.

From the answer options on which search strategies the firm used, I constructed five dummy variables that are 1 if a search strategy is used and 0 if it is not used (see table I for descriptive statistics). In addition to these dummy variables, I use the number of search strategies as a further explanatory variable to identify whether the effectiveness of referrals is limited to a certain marginal utility.

The regression equation is complemented by a set of further control variables which can be assigned to one of the following groups:

- requirements of the open position (qualification, special requirements)
- macroeconomic setting of the firm (regional unemployment rate, geographical setting)
- firms' characteristics (firm size, branch)

Table I. Frequency statistics of key variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Frictionless hiring	32,194	0.508	0.500	0	1
Duration of delay in days	14,666	53.009	58.935	1	1036
Search through advertisement in newspapers (s1)	32,194	0.350	0.477	0	1
Search through employee referrals (s2)	32,194	0.439	0.496	0	1
Search through employment agencies (s3)	32,194	0.434	0.496	0	1
Search through the Internet (s4)	32,194	0.440	0.496	0	1
Internal search (s5)	32,194	0.245	0.430	0	1
Number of search strategies used	32,194	1.908	1.119	0	5

Source: IAB Job Vacancy Survey 2010–2014

3. Results

Table II presents the results of the probit regression models that explore the relation between the use of referrals and the probability of frictionless hiring. Each model is restricted to a sample that contains firms using a specific number of search strategies to identify the effect of referrals in comparison with other and more search strategies. The rationale behind is it, to identify the most efficient combination of search channels for each group of firms and whether it includes referrals or not. This means in detail: The second column presents estimation results for firms that only use one channel of job search. Given that, there are five possible job search channels it is clear that there are five groups of firms in this sample, so the whole sample can be covered by four dummy variables and one reference category. In the third column where the sample is restricted to firms that use two search channels, there are ten different firm types depending on the combination of search channels. It is rationale to define nine dummy variables

for each of the possible firm types in this sample and one reference category. The same holds true for the fourth column, which again contains ten types of firms. The fifth column only contains firms that use four search channels out of five. Therefore, there are again five groups of firms, which can be covered by four dummy variables.

The results show that the exclusive use of referrals is the only strategy that is positively correlated with the probability of a frictionless hiring compared to an exclusive use of internal search (model 1). Referrals retain their positive influence when two search strategies are used; only in combination with the search through employment agencies, they cannot maintain their effectiveness (model 2). When three and more search strategies are used, referrals lose their effectiveness almost completely, especially if the search through employment agencies is one of the chosen strategies (models 3 and 4). Furthermore, models 3 to 5 give the impression, that the number of search strategies is negatively correlated with a frictionless hiring overall. As model 5 shows, with every additional search strategy, the probability of delay increases by approximately 7 percentage points, because firms tend to add search strategies when they are nearing a delay (Heckmann et al., 2013).

Table II. Probability of frictionless hiring using different search strategies, probit regression model

	Model 1	Model 2	Model 3	Model 4	Model 5
Reference: Internal search (s5)					
Search through advertisement in newspapers (s1)	-0.016				
	(0.027)				
Search through employee referrals (s2)	0.040***				
	(0.014)				
Search through employment agencies (s3)	-0.077***				
	(0.015)				
Search through the Internet (s4)	-0.057***				
	(0.020)				
Reference: Search through the internet and internal search (s4s5)					
s1s2		0.091***			
		(0.024)			
s1s3		-0.009			
		(0.027)			
s1s4		0.061***			
		(0.019)			
s1s5		0.046			
		(0.044)			
s2s3		-0.002			
		(0.017)			
s2s4		0.085***			
		(0.016)			
s2s5		0.154***			
		(0.023)			
s3s4		0.002			
		(0.016)			
s3s5		-0.006			
		(0.023)			
Reference: Search through the internet, internal search and advertisement in newspapers (s4s5s1)					
s1s2s3			-0.137***		
			(0.031)		
s1s2s4			-0.043**		
			(0.019)		

	Model 1	Model 2	Model 3	Model 4	Model 5
s1s2s5			0.034		
			(0.049)		
s1s3s4			-0.084***		
			(0.022)		
s1s3s5			-0.021		
			(0.037)		
s2s3s4			-0.097***		
			(0.028)		
s2s3s5			-0.054		
			(0.039)		
s2s4s5			-0.014		
			(0.033)		
s3s4s5			-0.073***		
			(0.024)		
Reference: Search <u>without</u> the use of internal search (s1s2s3s4)					
s2s3s4s5				-0.008	
				(0.026)	
s1s3s4s5				0.046**	
				(0.018)	
s1s2s4s5				0.081***	
				(0.027)	
s1s2s3s5				-0.072*	
				(0.040)	
Number of search strategies used					-0.066***
					(0.004)
Sample restricted to no. of search strategies used	1	2	3	4	
Requirements of the open position	Yes	Yes	Yes	Yes	Yes
Macroeconomic settings of the firm	Yes	Yes	Yes	Yes	Yes
Firms' characteristics	Yes	Yes	Yes	Yes	Yes
Observations	12,220	9,102	5,960	2,598	32,194
Pseudo R^2	0.021	0.032	0.032	0.045	0.036
Linktest for model fit	0.126	0.408	0.826	0.747	0.783

*Source: IAB Job Vacancy Survey 2010–2014; marginal effects are presented, robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

Given that a delay occurs, the second question asks for the relation between the use of referrals and the duration of the delay (table III). Solely used, referrals shorten the duration of delay by a factor of 0.76 (exp(-0.273) = 0.761), which is 76 percent of the average duration of delay that is 53 days (table 1). Therefore, the solely use of referrals shortens the duration of delay by 13 days on average. The positive effects of referral use retains when using two search strategies (model 2), but turns into the opposite when using three search strategies (model 3). This corresponds to the findings of Gorter *et al*. from 1996 that the use of referrals either leads to successful matching very fast or not at all. Using more than three search strategies does not show a clear advantage of referrals (model 4), but again, there is a prolonging effect by a factor of 1.20 for the use of five search strategies (exp(0.188) = 1.206), which again underlines the assumption that firms tend to use more search strategies when they face problems in filling their vacancies.

Table III: Relation of different search strategies and the duration of delay of recruiting, accelerated failure time model

	Model 1	Model 2	Model 3	Model 4	Model 5
Reference: Internal search (s5)					
Search through advertisement in newspapers (s1)	-0.215***				
	(0.054)				
Search through employee referrals (s2)	-0.273***				
	(0.079)				
Search through employment agencies (s3)	-0.160***				
	(0.058)				
Search through the Internet (s4)	-0.088				
	(0.078)				
Reference: Search through the internet and internal search (s4s5)					
s1s2		-0.272***			
		(0.051)			
s1s3		-0.109			
		(0.075)			
s1s4		-0.121***			
		(0.024)			
s1s5		0.035			
		(0.111)			
s2s3		-0.140**			
		(0.071)			
s2s4		-0.191***			
		(0.046)			
s2s5		-0.271***			
		(0.050)			
s3s4		-0.054*			
		(0.030)			
s3s5		-0.089			
		(0.101)			
Reference: Search through the internet, internal search and advertisement in newspapers (s4s5s1)					
s1s2s3			0.216**		
			(0.092)		
s1s2s4			0.107*		
			(0.062)		
s1s2s5			0.197		
			(0.182)		
s1s3s4			0.121*		
			(0.070)		
s1s3s5			0.036		
			(0.068)		
s2s3s4			0.241***		
			(0.046)		
s2s3s5			0.093		
			(0.076)		
s2s4s5			0.009		
			(0.082)		
s3s4s5			0.074		
			(0.076)		
Reference: Search <u>without</u> the use of internal search (s1s2s3s4)					
s2s3s4s5				-0.065	
				(0.074)	
s1s3s4s5				-0.169**	
				(0.077)	

	Model 1	Model 2	Model 3	Model 4	Model 5
s1s2s4s5				-0.230***	
				(0.066)	
s1s2s3s5				-0.006	
				(0.181)	
Number of search strategies used					0.188***
					(0.005)
Sample restricted to number of search strategies used	1	2	3	4	
Requirements of the open position	Yes	Yes	Yes	Yes	Yes
Macroeconomic settings of the firm	Yes	Yes	Yes	Yes	Yes
Firms' characteristics	Yes	Yes	Yes	Yes	Yes
Observations	4,484	4,442	3,311	1,563	14,666
Linktest for model fit	0.227	0.388	0.865	0.275	0.011
shape parameter *p*	0.990	1.074	1.119	1.153	1.047

*Source: IAB Job Vacancy Survey 2010–2014; coefficients are presented, robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

4. Conclusion

The objective of this paper is to identify the effectiveness of employee referrals for employers' recruitment processes by implementing the delay in recruiting as a measure for effective recruiting processes. The results of the analyses show that referrals are positively correlated with the probability of a frictionless hiring, but only if firms decide to use a small number of parallel search strategies. This holds true if a delay occurs. In this case referrals only show a positive influence on the reduction of delay, if not more than one search strategy is used aside.

To sum up, employee referrals can be a useful instrument that allows firms to reduce searching, screening and transaction costs that arise during the recruitment process. However, they only have a beneficial effect on the recruiting process if they are used solely or in addition to only very few other search strategies.

Acknowledgements: In developing the ideas presented here, I have received very helpful input from Prof. Dr. Martin Abraham, PD Dr. Gerhard Krug and Dr. Michael Stops. I also thank two anonymous reviewers for their feedback.

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