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Success and failure in the operational recruitment process

Contrasting the outcomes of search

Martina Rebien
Alexander Kubis
Anne Müller

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Martina Rebien, Alexander Kubis, Anne Müller (IAB)

Mit der Reihe „IAB-Discussion Paper“ will das Forschungsinstitut der Bundesagentur für Arbeit den Dialog mit der externen Wissenschaft intensivieren. Durch die rasche Verbreitung von Forschungsergebnissen über das Internet soll noch vor Drucklegung Kritik angeregt und Qualität gesichert werden.

The “IAB-Discussion Paper” is published by the research institute of the German Federal Employment Agency in order to intensify the dialogue with the scientific community. The prompt publication of the latest research results via the Internet intends to stimulate criticism and to ensure research quality at an early stage before printing.

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Abstract

Following microeconomic theory, every vacancy should be filled by appropriate manpower after a certain time. However, from an empirical point of view it is evident that vacancies remain unfilled as establishments cancel their search for a suitable applicant.

The German Job Vacancy Survey (JVS) is a representative survey of job offers for the entire German economy and provides information about the search and matching processes for both the establishments' most recent hires and for failures in the recruitment processes. The analysis is based on a binary explanatory variable, resulting from the interaction of individual successful and unsuccessful search processes (cancellation probability).

Our results show that with increasing recruitment duration, the number of search cancellations becomes more likely. Moreover, the results indicate that the probability of a search cancellation is strongly linked to the characteristics that an applicant must provide and to the way the search is organised.

Zusammenfassung

In der Theorie sollte jede offene Stelle über kurz oder lang durch eine geeignete Arbeitskraft besetzt werden. Aus empirischer Sicht zeigt sich jedoch, dass offene Stellen unbesetzt bleiben, wenn Firmen die Suche nach einem geeigneten Kandidaten aufgeben.

Die IAB-Stellenerhebung (IAB-SE) ist eine repräsentative Betriebsbefragung zu offenen Stellen und Stellenbesetzungsprozessen in Deutschland. Sie bietet Informationen sowohl zu aktuellen Stellenbesetzungen als auch zu erfolgloser Bewerbersuche. Die Analyse stützt sich dabei auf eine binäre abhängige Variable die für einen bestimmten Betrieb die erfolgreiche und nicht erfolgreiche Personalsuche identifiziert (Abbruchwahrscheinlichkeit).

Unsere Ergebnisse zeigen, dass eine längere Dauer der Personalsuche zu einer höheren Wahrscheinlichkeit von Abbrüchen führt. Zudem wird deutlich, dass ein Abbruch der Personalsuche stark mit den Anforderungen, die ein Kandidat für die offene Stelle aufweisen muss und der Art und Weise wie die Personalsuche organisiert ist, zusammenhängt.

JEL classification: J23, J63, D22

Keywords: establishment survey, job vacancies, labour demand

1 Introduction

Markets possess inherent characteristics that allow an equalization of supply and demand in the long run (Coase 1960). Therefore, with regard to the labour market, every vacancy should be filled by appropriate manpower after a certain time. Nevertheless, the German Job Vacancy Survey of the Institute for Employment Research (IAB) shows that in 2012 alone 725,000 vacancies remained unfilled in Germany (at least temporarily) as establishments cancelled their search for a suitable external applicant (Table 1). This number amounts to 12 per cent of all recruitment processes started by German establishments. The value clearly exceeds the frequently quoted percentage of 4 per cent in the case of the Netherlands (Van Ours/Ridder 1992: 145) but is clearly below 20 to 30 per cent stated for the United Kingdom (Andrews et al. 2008). Search cancellations are therefore of significant interest for the labour market.

Table 1
Personnel Recruitment in Germany 2008-2012

Year	(1) recruitment success (absolute)	(2) recruitment failures (absolute)	share of recruitment failures from all recruitment activities (1+2) (relative)
2008	4,707,000	736,000	13.5 %
2009	3,974,000	448,000	10.1 %
2010	4,747,000	517,000	9.8 %
2011	5,384,000	953,000	15.0 %
2012	5,296,000	725,000	12.0 %

Source: IAB - German JVS.

In reality, vacancies and unemployment coexist on the labour market. Besides mismatch regarding qualification or location of persons and jobs, there is also voluntary unemployment. Alvarez and Shimer (2011) address the question on job search and unemployment by integrating voluntary unemployment of job seekers into their model. They describe the possibility of renouncing the individual market entrance despite an existing job offer, which means to deliberately choose unemployment and to wait for better offers.

From the perspective of the establishment, a similar situation is conceivable: If no appropriate candidate can be recruited, the establishment might voluntarily cancel the search process. For a given supply and demand situation on the labour market, the establishment expects to fill a vacancy within a certain time period, for a certain wage offer and by using certain search channels. Wrong expectations, e.g. concerning the reservation wage of suitable applicants or skills shortages (Andrews et al. 2008), can be the reason that the establishment will not succeed in filling the vacancy. The establishment is then free to choose production technology alternatives or (after some time) to return to the labour market with a modified offer which better fits the given labour market supply.

Up to now, research on the failure of operational recruitment processes is scarce. In his explorative approach from 1978, Beaumont analyses the duration of registered vacancies from their registration until they are filled or cancelled to evaluate the reasons why there are hard-to-fill vacancies while there is high unemployment. He analyses the reasons for the cancellation taking differences of branches and the number of candidates into account. The long duration of cancelled vacancies and the high number of rejected candidates indicates that the applicants did not conform to the operational requirements. Furthermore, low wage levels, bad working conditions and an unfavourable location of the company are further reasons for high shares of cancelled vacancies (Beaumont 1978). Andrews et al. (2008) conducted an evaluation on the determinants of the duration of employer search in the United Kingdom using duration models building on a sequential search model. They find that vacancies expire due to skills shortages especially in non-manual occupations. The authors furthermore find that the expiry of vacancies is positively correlated with the duration of search. The longer the search for a candidate takes, the more likely is the cancellation of the search. The authors recommend for further research to take information on the choice of different search channels into account to analyse whether expiring vacancies are a more general problem (Andrews et al. 2008).

In our paper, we focus on different factors that determine success and failure in the operational recruitment process, taking search duration and search channels as explanatory factors into account. Research focussing on both search duration and search channels is also quite scarce. For the latter, the analyses describe different search strategies such as intensive search that describes the selection process of candidates or extensive search which is the search effort using different search strategies (Barron et al. 1985). Van Ommeren and Russo (2009) also characterise the search process itself. Thus, the type of preferred recruitment behaviour, meaning the selection of a sequential or non-sequential search process, depends on the type of search channel. Van Ours and Ridder (1992) note that over time, the type of operational search process changes from non-sequential to sequential search behaviour. Furthermore, a number of papers focussing on the search duration exist, which also take different search strategies into account (van Ours 1989; van Ours/Ridder 1991; Burdett/Cunningham 1998). Thereby, the sequential search model is often the basis for the selection of recruitment channels (Gorter/van Ommeren 1999) also depending on the probability that a vacancy is filled (Burdett/Cunningham 1998).

To our knowledge, this is the first analysis that contrasts the determinants for both possible outcomes of the recruitment process, i.e. the success of filling a vacancy or its cancellation, by taking both the duration of search and the use of different search channels into account. For our analysis we use data from the German Job Vacancy Survey 2011 and 2012. It collects key figures and explanatory variables for the entire establishment as well as information about new recruitments and recruitment failures on an individual basis. These data permit the comparison of successful recruitment and search cancellations from an operational point of view. The search

cancellation is examined on the individual level. This means the binary dependent variable *cancellation probability* arises from the interaction of individual successful and unsuccessful search processes. Our results support the findings of Andrews et al. (2008) that the cancellation of a search process is positively correlated with the duration of search and due to specific characteristics of the vacancy such as required qualification.

The structure of the paper is as follows: After a theoretical classification of the research question, a differentiated presentation of the research design is provided. Then, the main results of the estimations are presented and form the basis of the final conclusion.

2 Theoretical approach

Even if there is no appropriate theoretical explanatory approach at first sight, theoretical connecting factors that explain the cancellation of vacancies exist: Microeconomic search theories which are based on Stiegler (1961) are generally focused on the explanation of individual labour supply (McCall 1970; Mortensen 1970; Mortensen/Pissarides 1994, 1999). A homogeneous establishment that offers a vacancy for an existing wage level is considered. Subsequent work differentiates the vacancies with regard to branch or region or even professional and qualification-specific segments of the labour market. The models distinguish between sequential and non-sequential recruitment behaviour. However, the final result of the process is successful recruitment and balance on the market. Search cancellation is initially not included in the model, but sequential search theory can provide the initial arguments to evaluate search cancellations.

Based on these models, the duration of unemployment is defined as the time between the beginning of the search for and the finding of a new job. During this time, a job seeker decides, depending on his/her reservation wage, whether he/she accepts an incoming job offer or continues searching. If he/she continues searching, the duration of search is prolonged and the costs of search increase. Therefore, each time the job seeker receives a job offer, he/she has to decide whether his/her reservation wage still transcends the search costs and whether it is still worthwhile to continue searching (cf. Borjas 2010). Transferring this theoretical baseline to companies, the vacancy duration is examined as the time period between the beginning of the operational search to fill a vacancy and the filling of this vacancy with a suitable applicant. The company also invests in the search for candidates to fill an open position by choosing different search channels and decides for each incoming person offering his/her manpower whether to finish the search or to continue it. The basis for decision-making on the job seeker side is the reservation wage. Its amount depends on individual characteristics of the person such as the human capital he/she sells. The equivalent on the company side is the expected productivity of a new employee which is defined by minimum qualification requirements on the open position (cf. Franz 2006).

Therefore, both sides of the labour market are faced with decisions under uncertainty when searching for a new job and a candidate respectively. Following the rational choice theory, the search process follows two assumptions: the assumption of profit maximisation and the assumption of action limitations. This means that in situations actors have to make decisions, they try to achieve their preferences to the best outcome, while their acting is limited by certain restrictions (cf. Diekmann/Voss 2004). Concerning the search process of companies and job seekers this means that both have to decide whether it is worthwhile to accept an offer or to continue searching. Both sides do not have full information on the labour market as a whole. Job seekers do not know whether any upcoming job offers, if there are any, will be for higher wages and companies do not know whether the upcoming candidates, if there are any, have a higher productivity than the ones before. The more imprecise the information, the higher are the search costs, i.e. the number of search cancellations. In some branches it can be observed that the number of vacancies is higher than the number of unemployed individuals with the appropriate qualification profile. Despite the knowledge of the unfavourable distribution of the labour supply, a vacancy can be created especially in a situation with an extremely high return on investment. In this case, the planned recruitment duration should conform to the actual search duration. Therefore, both sides of the labour market must decide whether the outcome of further search will exceed the search costs they have already spent. That means for unemployed persons that they should continue searching until they find a job offer that matches their reservation wage in relation to their already spent search costs best, even though it might not be the maximum of what they wanted to achieve. If job seekers decide not to accept the given job offers, then they take “voluntary unemployment” into account.

Regarding the companies’ perspective in the search process, the required productivity of the vacancy is continuously compared with the supposed productivity of the incoming applications if there are any. As soon as a suitable application is presented, a job offer follows and its acceptance ends the search process. If companies do not find a candidate for their open position who complies with the costs that are in accordance with the expected productivity, they take an unfilled vacancy into account. For a given supply and demand situation, the establishment expects to fill a vacancy within a certain time period (Burdett/Cunningham 1998). Wrong expectations, e.g. concerning the formal qualification of suitable applicants, can be the reason that the establishment will not succeed in filling the vacancy. Under certain circumstances it is rational for the establishment to withdraw its offer if it observes that its requirements do not comply with the market situation. When companies (have to) decide to cancel the search process for a vacancy, they are free to choose production technology alternatives or (after some time) to return to the labour market with a modified offer. Both reactions on search cancelation are common in German establishments (Table 2).

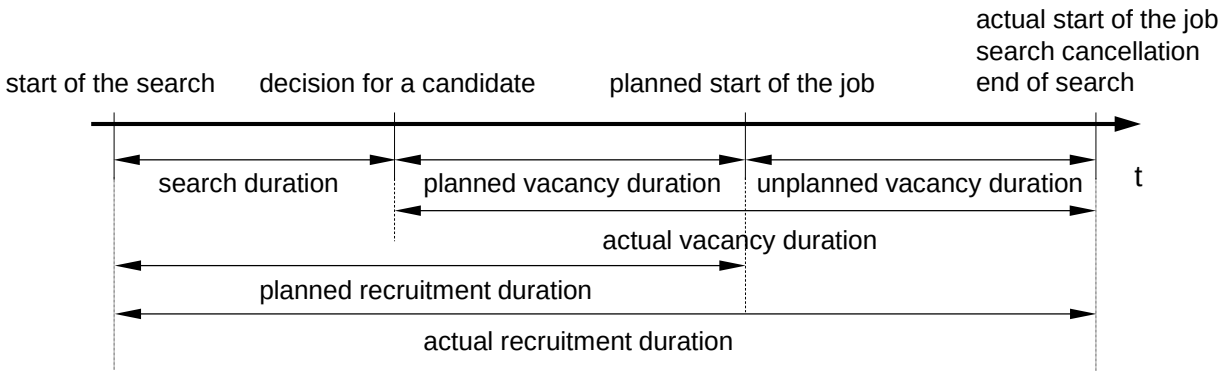
Table 2
Companies' reaction on search cancellations 2011 and 2012

	Sample 2011	Sample 2012
Temporary / hired-out work	12.5	13.4
Tasks were performed by other employees during regular working hours	34.3	34.0
Tasks were performed by other employees working overtime or changing from part-time to full-time work	39.4	36.2
Technical / organizational modifications were made	27.7	27.9
We abstained from accepting orders	25.9	26.4
The vacation was filled internally	9.4	8.6
Currently no more demand for additional personnel due to current market situation	5.2	6.2

Source: IAB - German JVS.

We therefore assume that the requirements of the vacancy and wrong expectations concerning the supply side of the labour market and the search process are essential factors that influence the probability of a company's success or failure in the recruitment process (*cancellation probability*). For the operationalization of the recruitment process on the individual company level, we use information about the search duration. The information about the milestones of the recruitment process from the start of the search for a candidate to the planned start of employment until the termination of the search process is available in the data. There we have information on the start of the search, the date for the decision for a candidate, the planned start of employment and when the search was ended either by hiring a new employee or by search cancelation, all on a daily basis (Figure 1, for more detailed information see Dietz et al. 2012, in German). Different indicators can be derived from the stated milestones of the recruitment process.

Figure 1
Schematic presentation of the search and vacancy times in the operational recruitment process



Source: authors' own graph; taken from Dietz et al. 2012.

For the operationalization of the establishment's expectations, we find the planned recruitment duration to be most relevant, because we assume that a search cancellation will become more likely if the establishment expects the search process to be difficult in advance. If so, companies are likely to invest more time in the search from the beginning. Thus, increased planned recruitment duration should be positively

correlated with a higher share of search cancellations. From the establishment's point of view, the expectations concerning the success of recruitment diminish and a significantly longer unplanned vacancy duration must be taken into account if the planned recruitment duration exceeds the expectations. Furthermore, upward deviations from the operational expectations are quantified by the excess of the planned recruitment duration. This indicator measures whether the establishment misjudged the vacancy duration. The larger the discrepancy, the higher is the probability of a search cancellation. In the theoretical case of a decision under uncertainty, extending the planned recruitment duration must be considered; in the best case it is equal to the actual recruitment duration.

3 Dataset and empirical strategy

To explain the different operational and structural effects on success or failure in the recruitment process, we use data from the German Job Vacancy Survey by the Institute for Employment Research (IAB)[1] (cf. Kettner et al. 2011). Since 1989, the written survey has been sent out to Human Resource Managers and managing directors in every fourth quarter of a year as a cross-sectional survey. Since there is no compulsory notification of vacancies in Germany, official statistics do not represent the whole labour demand in the German economy, neither in their size, nor in their structure. Therefore, the Job Vacancy Survey is the only source to provide information on the whole labour demand in Germany. Furthermore, the survey gives detailed information on the sequences and backgrounds of operational recruitment processes

Indicators for the operational expectations concerning the recruitment process are therefore the planned recruitment duration and the deviation between the planned and the actual recruitment duration. In the case of a successful recruitment, the planned recruitment duration had an average length of 52 days in 2011 and 56 days in 2012, while the actual recruitment duration amounted to an average of 76, resp. 82 days, which is almost 30 per cent longer than expected (Brenzel et al. 2013). In the case of an unsuccessful recruitment process, the establishments assumed a considerably increased average search duration of 86 days. If the planned recruitment duration was exceeded, the search was cancelled after 177 days on average.

Aside from these two temporal indicators, different structural parameters are considered that characterize the type of vacancy (Table 3). Following Andrews et al. (2008), we assume that an increasing quantity of applications decreases the probability of search cancellation, because a higher number of applicants should normally result in a higher number of suitable applicants. Furthermore, we follow Beaumont

[1] Data from the survey are available as a Scientific Use File at the Research Data Centre (FDZ) of the Federal Employment Agency at the Institute for Employment Research in Germany (cf. Müller/Rebien/Vogler-Ludwig 2013).

(1978) and expect that the more attractive (larger, more renowned, etc.) the establishment, the higher the number of applicants for a similar vacancy will be.

In addition to the number of applicants, their qualitative suitability plays a decisive role (cf. Andrews et al. 2008). A situation can be possible in which no applicants reach the operationally required level of productivity. We approximate the attainable level of productivity of an applicant using three qualification-specific indicators: the professionally required human capital, the formal minimum qualification and the necessary professional experience. The more likely it is that the vacancy was created for a person with a profession in the ISCO 88 COM codes 2 or 3 (HRSTO: Human Resources in Science and Technology in terms of Occupation) or for a person with a college of higher education/university degree, the more demanding the personnel search is. The recruitment process can become very difficult, the cancellation probability rises, because there is a smaller choice of suitable candidates, because high skill levels are more problematic to be substituted than low skill levels. With required professional experience, the probability of an operational search cancellation increases as well.

Table 3
The mean values of the explanatory variables for success and failure on the individual level, Germany 2011 and 2012

Explanatory variables	Calculation rule	Sample 2011	Sample 2012
Operational expectations			
Planned recruitment duration	*in days*	75.88	72.66
Misjudgement	*Actual recruitment duration/ planned recruitment duration*	1.99	2.05
Structural components			
Number of applicants		8.94	8.92
HRST occupations	*ISCO 88 COM codes 2 or 3 = 1, otherwise zero*	0.38	0.43
Formal qualification	*college of higher education, university = 1, otherwise zero*	0.19	0.21
Professional experience	*yes = 1, otherwise zero*	0.57	0.52
Search radius only regional	*yes = 1, otherwise zero*	0.87	0.82
Search radius also international	*yes = 1, otherwise zero*	0.05	0.06
Number of search channels		3.77	3.54
Vacancy registered with Federal Employment Agency	*yes = 1, otherwise zero*	0.59	0.62
Use of personal contacts and colleagues to find candidates	*yes = 1, otherwise zero*	0.05	0.05
Other search channels	*yes = 1, otherwise zero*	0.86	0.86

Source: IAB - German JVS 2011 and 2012.

According to the analyses on search channels, it can be shown that the recruitment duration is reduced by the interregional utilization of alternative search channels. The probability of finding a suitable applicant should increase with a larger search radius and the utilization of different search channels. In contrast, the use of a variety of search channels can also be an indicator for difficulties in finding appropriate candidates. Heckmann, Noll and Rebien (2013) show that companies that experi-

ence difficulties finding candidates for their vacancies are more likely to use more search channels in parallel than those who experienced that they are able to recruit in the planned time. One important differentiation of search channels is between formal and informal methods of search. Especially informal search channels, such as contacts to friends and family, are often assumed to show advantages compared to more formal search channels: They ought to shorten the recruitment process, because information on open positions or possible candidates are transported faster through social networks (Granovetter 1995; Barber 1998; Gorter/van Ommeren 1999; Gorter/Nijkamp/Rietveld 1996; Holzer 1987). Furthermore, Gorter, Nijkamp and Rietveld (1996) find that informal contacts either lead to positive outcomes in the recruitment process very quickly or not at all. In the latter case, companies are likely to change their recruitment strategy. We will therefore integrate the use of personal contacts as one search channel in our model if it was used exclusively. Besides the assumption that personal contacts shorten the recruitment process, they are also said to be a very reasonable way to search for candidates. The same argument also applies for reporting an open position to the Federal Employment Agency. Since search costs are a key figure of the operational search process, we will include this search channel as well to control whether lower costs are likely to prolong the recruitment process and make the decision for a search cancellation less likely.

Possible branch and region-specific influences are considered using fixed effects for 23 industrial branches as well as for the 96 spatial planning regions (German ROR). The spatial planning regions of the Office for Building and Regional Planning (BBR) organise the German labour market into 96 regionally delimitable labour markets based on commuting between the administrative districts. The approach of a higher-order centre and its functional market area (aggregation of main land and surroundings) is largely respected.

The companies' decision process cannot be directly observed. Its result, however, can be operationalized as a yes/no decision in the variable cancellation probability. In the applied logistic regression model, the explanatory binary variable merely presents an indicator for the true latent factor to which the vacancy-specific exogenous variables are related. The relevant parameters can be determined by maximum likelihood estimation. As described above, in addition to the fixed effects for the industrial branches and spatial planning regions as well as the operational expectations, the different structural components of the individual search successes and failures are considered in the estimation for the explanation of the search cancellation.

4 Empirical results

Three models are tested against each other to evaluate the robustness of the estimations (Table 4). The first model contains only information on the operational expectations that explain the cancellation probability. The second model contains only structural components as explanatory variables. In the third model, both aspects are analysed together to identify effects under control for each group of variables. To

allow the comparison of the models, all three are evaluated over the same sample. The results of all three models with the maximal variation using different samples for each model are also examined (see Appendix). In comparison, the results of both approaches do not show much deviation from each other. Therefore, we decided to use the models for the constant sample for interpretation. The estimation of the logistic regression models leads to the following results:

An increased probability of operational search cancellation could clearly be related to a recruitment that was expected to be time-consuming and to a misjudgement in the form of prolonged vacancy duration. Our findings support the results from Beaumont (1978) and Andrews et al. (2008) who also did an evaluation on the duration of search and search cancellation. While those authors took the actual search duration until the filling or lapsing of the vacancy into account, we use misjudgement between the actual and the planned search duration as indicator for search activities that are prolonged. Our model shows that there is a significant connection between the probability of a search cancellation and the difference between the planned and the actual recruitment duration (misjudgement), whereupon an increasing number of search cancellations increased the search costs.

A wider choice of potential candidates, as we assumed, decreases the probability of a search cancellation. And it becomes more probable with an increasing formal minimum qualification of the applicants. When searching for candidates with a profession in the ISCO 88 COM codes 2 or 3 (HRSTO: Human Resources in Science and Technology in terms of Occupation) or increased professional experience, this leads to an increasing cancellation probability. This observation suggests that it is difficult to substitute for these special qualification requirements. This is also true for vacancies that require a university degree in Germany, which are more difficult to fill and thus lead to an increase in the cancellation probability. Even though, one would actually expect a converse effect, since such vacancies are less likely to be substituted by other workers than positions with lower qualification requirements. We would therefore assume that establishments that have to cancel such vacancies are likely to return to the labour market with a modified offer. Therefore, such cancellation we assume to be only temporary. Are more precise evaluation on the characteristics of temporary and final cancellations is a question for further research.

Contrary to our prior assumption, an exclusively regional search for suitable applicants tends to lead to a decreasing cancellation probability. In that sense, a restriction of the search appears to be a hint that an enlarged national search was not necessary for these establishments because sufficient applicants could be recruited in the region. We would expect this to be more jobs that require a low qualification level, because we would expect firms that are interested to find candidates for very demanding positions to search with a wider radius from the beginning.

These statements conform to the positive effect of an increasing number of search channels on the cancellation probability, which can be interpreted as an indication

for skills shortages. An increasing skills shortage leads to the utilization of alternative search channels. The more search channels an establishment applies, the lower the establishment's success in filling the vacancy using only few channels, according to the assumption that companies use additional search options if finding candidates becomes more problematic (cf. Heckmann/Noll/Rebien 2013) and the probability of a search cancellation increases. Furthermore, we find that social contacts, if used exclusively, have a strongly negative effect on the cancellation probability. This result speaks for social networks to have a positive effect on the matching probability, which means that companies have a lower risk of failure in the recruitment process when using this way of searching controlled for the given parameters. Whether this result is universally valid must be an issue for further research on the subject, because the evaluation of social networks on the labour market generates a variety of results that support this finding but also contradict it (cf. Mouw 2006, Granovetter 1995, van Ours und Ridder 1992).

Overall, our findings confirm the results from Andrews et al. (2008) even though it was a different empirical approach we used: We found indications for skills shortages with regard to an increasing number of search channels. We also found that cancelled vacancies are strongly related to longer search durations, measured as the misjudgement between the actual and planned recruitment duration. Additionally, we followed the recommendation from Andrews et al. (2008) and used information on search strategies to explain a part of the cancellation probability and found that not only the search radius but also the choice of certain search cannels is influential.

Table 4
Estimation of the individual level for success and failure, explanatory variable: cancellation probability (recruitment failures =1, otherwise 0)

Explanatory variables	Model 1 Odds Ratio *(SE)*		Model 2 Odds Ratio *(SE)*		Model 3 Odds Ratio *(SE)*	
(Intercept)	0.447		0.392	*	0.270	**
	(0.231)		*(0.215)*		*(0.150)*	
Operational expectations						
Planned recruitment duration	1.006	***			1.005	***
	(0.001)				*(0.001)*	
Misjudgement	1.037	***			1.022	*
	(0.013)				*(0.011)*	
Structural components						
Number of applicants			0.986	***	0.984	***
			(0.002)		*(0.003)*	
HRST occupation (2 or 3)			1.331	***	1.282	**
			(0.127)		*(0.124)*	
Formal qualification (college or higher)			1.317	**	1.210	*
			(0.147)		*(0.138)*	
Professional experience required			1.163	**	1.170	**
			(0.089)		*(0.091)*	
Search radius only regional			0.754	**	0.796	*
			(0.086)		*(0.092)*	
Search radius also international			1.100		1.029	
			(0.192)		*(0.184)*	
Number of search channels			1.183	***	1.163	***
			(0.027)		*(0.027)*	
Vacancy registered with Federal Employment Agency			1.130		1.150	
			(0.105)		*(0.109)*	
Exclusive use of personal contacts and colleagues to find candidates			0.254	***	0.256	***
			(0.072)		*(0.073)*	
Other search channels			1.012		0.985	
			(0.159)		*(0.156)*	
Year 2012 (Reference: 2011)	1.080		1.072		1.095	
	(0.080)		*(0.081)*		*(0.084)*	
Fixed Effects						
Regional dummies	Reference planning region: 1101					
Industry dummies	Reference: sector 21					
Observations	3323		3323		3323	
Area under ROC-curve	0.626		0.663		0.685	
McFadden's Pseudo R^2	0.034		0.062		0.080	
Count R^2	0.597		0.615		0.639	
Hosmer-Lemeshow goodness of fit test	0.028		0.268		0.133	
Log-Likelihood Full Model	-2226		-2159		-2120	
AIC*n	4694		4577		4502	
BIC'	818		750		688	

Source: IAB - German JVS 2011 and 2012.

5 Conclusion

The research on successful and unsuccessful employer search is scarce. But the question how companies recruit and what the determinants for their successful recruitment are is important to understand why “voluntary unemployment” and unfilled vacancies exist on the labour market.

Our paper contrasts successful and unsuccessful operational recruitments in Germany for the first time and provides characteristics that determine a search cancellation. Using data from the German JVS, the empirical work observed the connection between search cancellation and the characteristics of the vacancy on an individual level. The dataset enables us to compare successful search processes and the search cancellations of German establishments taking different search channels into account. The obtained results show a clear distinction between successful and unsuccessful search processes. A methodological development from both an empirical and a theoretical point of view should be the objective of future research to refine the foundation of the operational recruitment process. Possible subjects would be to analyse the causality between successful recruitment and the regional range and number of different search channels.

Based on the sequential search theory, we assumed that a search cancellation is primarily regarded as a decision under uncertainty that offers the opportunity for the establishment to reconsider the existing job offer or to use alternative recruitment channels. Our results support that assumption since the operational misjudgement regarding the duration of the recruitment process is of great importance for the decision whether to cancel a search. Furthermore, it becomes obvious that with increasing planned recruitment duration itself (regardless of a possible misjudgement), the probability of a search cancellation increases. Both results indicate that time is an important factor whether or not a recruitment process results in a new hire.

Moreover, a significant influence on search cancellation can be confirmed for some of the individual and structural characteristics of the vacancy. Thus, the probability of search cancellation increases when there is an unsatisfactory quantity of applicants, thus narrowing the choice for the establishment. Also, higher skill requirements for the vacancy make a cancellation more probable since they are harder to find on the labour market.

Recruitment alternatives, such as the exclusive use of personal contacts, decrease the probability of a search cancellation. This supports the assumption that personal contacts can lead to a better match. The operational search effort on the other hand, which is represented by the number of applied search channels, proves to be a clear indication of a potential search cancellation. Appearing unexpected at first glance, the results clear up when we assume that establishments tend to apply a higher number of search channels when they expect the recruitment process to be difficult from the beginning. Therefore, this result also provides an indication for the assumption that establishments learn from initial misjudgements.

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Appendix

Estimation of the individual level for success and failure, explanatory variable: cancellation probability (recruitment failures =1, otherwise 0) models over different samples

	Model 1		Model 2		Model 3	
Explanatory variables	Odds Ratio *(SE)*		Odds Ratio *(SE)*		Odds Ratio *(SE)*	
(Intercept)	0.482		0.463		0.270	**
	(0.241)		*(0.223)*		*(0.150)*	
Operational expectations						
Planned recruitment duration	1.006	***			1.005	***
	(0.001)				*(0.001)*	
Misjudgement	1.036	***			1.022	*
	(0.013)				*(0.011)*	
Structural components						
Number of applicants			0.984	***	0.984	***
			(0.002)		*(0.003)*	
HRST occupation (2 or 3)			1.404	***	1.282	**
			(0.117)		*(0.124)*	
Formal qualification (college or higher)			1.246	**	1.210	*
			(0.121)		*(0.138)*	
Professional experience required			1.112		1.170	**
			(0.072)		*(0.091)*	
Search radius only regional			0.835	*	0.796	*
			(0.080)		*(0.092)*	
Search radius also international			1.244		1.029	
			(0.186)		*(0.184)*	
Number of search channels			1.157	***	1.163	***
			(0.022)		*(0.027)*	
Vacancy signed up with Federal Employment Agency			1.230	***	1.150	
			(0.097)		*(0.109)*	
Exclusive use of personal contacts and colleagues to find candidates			0.222	***	0.256	***
			(0.051)		*(0.073)*	
Other search channels			0.868		0.985	
			(0.109)		*(0.156)*	
Year 2012 *(Reference: 2011)*	1.078		0.998		1.095	
	(0.077)		*(0.064)*		*(0.084)*	
Fixed Effects						
Regional dummies	Reference planning region 1101					
Industry dummies	Reference: sector 21					
Observations	3508		4511		3323	
Area under ROC-curve	0.625		0.653		0.685	
McFadden's Pseudo R^2	0.034		0.056		0.080	
Count R^2	0.603		0.605		0.639	
Hosmer-Lemeshow goodness of fit test	0.000		0.099		0.133	
Log-Likelihood Full Model	-2349		-2953		-2120	
AIC*n:	4940		6164		4502	
BIC':	814		729		688	

Source: IAB - German JVS 2011 and 2012.

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Regensburger Str. 104
D-90478 Nuremberg

Editorial staff
Regina Stoll, Jutta Palm-Nowak

Technical completion
Jutta Palm-Nowak

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For further inquiries contact the authors:

Martina Rebien
Telefon 0911.179 3154
E-mail martina.rebien@iab.de

Alexander Kubis
Telefon 0911.179 8978
E-mail alexander.kubis@iab.de