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Effectiveness of social capital in the job search process

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Ralf Werner Koßmann

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Abstract

The empirical literature has provided ample yet contradictory evidence on the effectiveness of social ties in the job search process in terms of post-hire outcomes, such as wages or job satisfaction. Whereas early research, mainly focussing on the U.S. labour market, found positive correlations between finding a job via social ties and post-hire outcomes, most recent studies reported inconclusive or even negative correlations. Country differences in the effectiveness of social ties could be explained by differences in the effectiveness of other search channels, e.g. public institutions. Therefore, this study contributes to the existing literature by investigating the effectiveness of social ties in the German labour market which is commonly regarded as rather strict and monitored by strong labour market institutions. Based on data from the German Socio-Economic Panel (SOEP), it is analysed whether wages, job satisfaction, and fluctuation are affected by the job finding channel. Furthermore, this is the first study which investigates whether job changes affect wage and job satisfaction differentials between the current and the previous job. Results show that finding a job via social ties is not related to higher income; yet, weak evidence can be found for higher job satisfaction and a reduction in turnover.

JEL-Classification: J24, J28, J31, J63

Keywords: job search, social ties, wage, job satisfaction, turnover

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1 Introduction

As part of the human resource management, recruitment is responsible for the procurement of human capital and its success “depends in part on the quality and quantity of new employees identified and attracted through the recruitment” (Barber, 1998: 1). An important determinant of the success of the recruitment process is the degree to which employer and employee fit together. In the recruitment literature, the degree of job matching is usually investigated in two dimensions, person-job (P-J) fit and person-organisation (P-O) fit (Carless, 2005). While person-job fit describes the degree to which an individual’s skills and abilities match the respective job requirements (Edwards, 1991), person-organisation fit refers to the degree to which an individual fits to a given organisational culture (O’Reilly et al., 1991). Both firms and job seekers aim to find a partner that generates the highest degree of fit in order to maximise their profits respectively their utility.

However, both employers and employees do not dispose of perfect information on the respective other market side but lack relevant information about each other. Hiring decisions, respectively the decision to accept a given job offer, have to be made at the risk of a poor employer-employee fit. On the demand side of the labour market, employers cannot observe or foresee the applicants’ abilities and motivation or performance and shirking behaviour. Applicants, on the supply side, generally lack trustworthy information with regards to promotion perspectives, behaviour of supervisors and co-workers, and corporate culture. Ben-Porath (1980) concluded that “faceless” individuals and firms meet in the market, yet, more information on the respective other’s “face” could be helpful to avoid potential mismatch. Deficient congruence of characteristics or needs or abilities might result in lower job satisfaction, weaker performance (Pervin, 1968), and, consequently, higher voluntary and involuntary turnover.

To overcome these mutual information asymmetries, labour market participants from both market sides could utilise their social capital in the form of personal contacts to fill vacancies or find new jobs. In analogy to the concept of human capital as the embodiment of knowledge in an individual, Coleman (1988) defined social capital as the “structure of relations between actors and among actors”. Social capital – like physical and human capital – is expected to improve individual outcomes, in this case job search. Social ties, in contrast to other search channels like internet or newspaper adverts, might be helpful if they are more likely to convey reliable information about job or firm characteristics (Wanous, 1978). Furthermore, job incumbents might spread information about job vacancies to selected members of their

network in order to maintain their reputation at their workplace (Ullman, 1966). Hence, theory implies that job referrals increase matching quality which is linked to post-hire outcomes (Pervin, 1968).

Several studies have investigated whether social ties are related to monetary and non-monetary post-hire outcomes. In his monograph “Getting a Job: A Study of Contacts and Careers” (first edition published in 1974), Granovetter (1995) provided ample evidence that social ties can be beneficial in the job search process. Furthermore, he was able to confirm theoretical arguments developed in his seminal paper “The Strength of Weak Ties” (Granovetter, 1973) that ties to mere acquaintances, i.e. people to whom one is not closely connected, are more helpful than connections to family members or close friends. Granovetter’s work laid the cornerstone for a whole stream of the economic and sociological literature. More recent studies, though, have found rather mixed findings on the effectiveness of social ties as a job search channel (see e.g. Antoninis, 2006; Delattre, Sabatier, 2007; Bramoullé, Saint-Paul, 2010; Pellizzari, 2010).

The contribution of this study to the empirical literature is fourfold. First, unlike other studies, this study uses a large representative dataset in order to investigate the effectiveness of social ties in the job search process. Current research is mainly based on small samples of one or few firms, hence focussing on hiring strategies of specific firms. Single firms, though, might differ in terms of their hiring strategies. In an empirical investigation of the Model of Cultural Fit (Mendonca, Kanungo, 1994), Aycan et al. (1999) showed that human resource practices used by firms are shaped by the specific corporate culture. Hence, to elucidate whether social ties are generally an important asset in the search process, this study utilises data from multiple firms and various kinds of employees.

Second, most studies are conducted in countries with less strict labour legislation. Granovetter’s study, for example, investigated the effectiveness of social ties in the U.S. labour market, which is commonly perceived as less rigid and more flexible in comparison to European labour markets (Nickell, 1997).¹ A study on the German labour market is meant to investigate if recruitment sources matter in an environment of collective wage agreements and wage posting instead of wage bargaining. If firms are not able or not willing to differentiate between employees recruited via different channels, the wage effect of finding a job via social ties should be zero. Yet, non-monetary benefits are still possible or even more important (in

¹ Kitschelt and Streeck (2003) criticised the lack of flexibility in German politics and explicitly mentioned the labour market as a target for reforms. Although several reforms have been implemented (e.g. the so-called Hartz reforms), Kemmerling and Bruttel (2006) still saw institutional inertia and resistance.

the absence of monetary benefits) when individuals decide to accept a job they found via social ties. In addition to this, Korpi (2001) argued that social ties might be less important in labour markets with stronger public institutions like employment agencies to which a large fraction of job openings is reported. Therefore, a study against the institutional background in Germany might yield different results than previous studies with the U.S. data.

Third, this study uses wage and job satisfaction differentials, i.e. the absolute or relative change between the income (job satisfaction) in the current job and income (job satisfaction) in the past job as a dependent variable. This allows to control whether individuals were earning higher wages even before the job change and to identify job finding channels that generate income (job satisfaction) increases. Furthermore, this approach reduces potential biases from unobserved time-invariant heterogeneity, since wages and job satisfaction in the current and the previous job are affected by the same unobservable factors.

Fourth, this article is (to the best of my knowledge) the first which considers reduced turnover as an outcome of job search channels in a large data set. Reduced turnover, i.e. the probability to leave the newly found employer or to be dismissed by the employer, could be a more reliable indicator of source differences in matching quality. In a labour market with stricter wage regulations employers might not be willing or able to differentiate between employees found via different channels. However, if social ties generate a better person-job fit it is less likely that the employee leaves the firm or is dismissed.

The remainder of this article is structured as follows: In chapter 2 the existing empirical evidence on the effectiveness of recruitment channels is summarised. Subsequently, the research methodology is described in chapter 3. Empirical evidence, both descriptive and multivariate is provided in 4. The findings are discussed in chapter 5. Chapter 6 concludes.

2 Literature Review and Hypotheses

The empirical literature on post-hire outcomes of recruitment channels has provided ample yet controversial evidence on the effectiveness of formal and informal means. In this chapter, selected studies are summarised and hypotheses regarding post-hire outcomes are formulated. First, the literature on monetary outcomes is reviewed; second, literature on non-monetary outcomes is summarised.

2.1 The Benefits of Social Ties in the Job Search Process

Differences in the effectiveness of recruitment channels can be measured at two points in time: First, the duration and costs of search through one particular channel can be considered.

For instance, better access to information on vacancies might increase the probability to find a job. These effects are called pre-hire outcomes because they arise before the working relationship begins.² However, the focus of this article lies on post-hire outcomes which emerge after the conclusion of the working contract. Post-hire outcomes can be separated into monetary and non-monetary outcomes. The first category comprises wages and all other kinds of work-income, such as bonuses and fringe benefits as they have a monetary value for the employee. Non-monetary outcomes cannot be valued monetarily, for example job satisfaction or (subjective) job security. Furthermore, turnover propensity is an appropriate measure to evaluate search channel effectiveness, but it cannot be clearly assigned to one of these categories. On the one hand, the propensity to leave the company is determined by the perceived (dis-)satisfaction with the current wage or general working conditions and, on the other hand, turnover has monetary costs for employers and employees.

The analysis of post-hire outcomes does not include costs of search channels, as these costs occur before the contract is concluded. Therefore, this paper does not aim at measuring the efficiency of search channels – as this would require a complex cost-benefit comparison which is rather impossible in the context of job search. Hence, the term effectiveness is preferred and applied to describe the comparison of post-hire outcomes. Furthermore, cases are ignored when employees search for a new job just in order to renegotiate their current contract.³

In their detailed literature review, Zottoli and Wanous (2000) named different hypothesis, all of which contribute to explain higher effectiveness of informal recruitment channels. These arguments can be divided into two major groups: information benefits and self-selection effects, which are described in the two following chapters.

2.1.1 Information Benefits

Most approaches argue that social ties as a search channel are able to provide job searchers or employers with more or better information about a job respectively the applicant. In the labour market, job seekers are confronted with heterogeneous firms and are lacking meaningful information on non-monetary aspects such as working conditions, fairness of supervisors or co-workers, promotion prospects, and matching of personal interests or

² In this context, Breaugh et al. (2003) found that job seekers who applied directly or were referred by personal contacts were more likely to find a job and Tazelaar (1990) detected that network size had a negative effect on unemployment duration in Germany. On the employer's side, direct search costs (measured hours of searching, interviewing, screening) were lower if new hires were referred by unions, relatives or friends (Bishop, 1993).

³ See Cahuc et al. (2006) for a game-theoretic bargaining model of this kind of on-the-job search.

required qualifications.⁴ Thus, search for further information about a job (intensification) might be efficient to reduce uncertainties and costs of resignation or dismissals. However, as noted above, acquisition of additional information is costly and – what is even more crucial – difficult to attain. Employers who suffer from vacancy costs are presumably not willing to divulge information that might discourage possible employees. As a result, information about working conditions conveyed by employers is usually not suitable to create a trustworthy image of the unobservable characteristics of a firm. Consequently, search costs at the intensive margin are high and mismatches are likely to occur.

Rees (1966) argued that friends or acquaintances are more likely to convey accurate information about job or firm characteristics, which Wanous (1978) termed **Realistic Job Previews** (RJP). The person who recommends a new employer is well informed about the firm he/she works for and the provided information are much more reliable – especially if he is a prospective co-worker. Less specific and trustworthy information can be provided by supervisors and, more obvious, by recruiters in the human resources department of a firm (Breugh, Starke, 2000). Simons et al. (1970) argued that the perception of similarity between source and receiver of a message – in this case belonging to the same side of the labour market – enhances persuasive credibility of the source of information. As information provided by prospective co-workers appears more trustworthy for potential applicants, they themselves can decide more accurately whether to apply for the job or not. Hence, applicants are more likely to self-select into jobs which meet both their skills and abilities better. If, for example, job satisfaction is determined by the perceived gap between desired and actual firm and job characteristics, more accurate ex-ante information will lead to a higher reported job satisfaction. Assuming that workers' abilities and the matching quality affect wages, one could expect higher wages for those who found their jobs through informal sources. Thus, the empirical results should reveal a direct positive effect of informal channels on wages and job satisfaction.

Ullman (1966) emphasised the **pre-screening** effect of job search via social capital. First of all, referrers are able to screen potential job candidates at lower costs as incentives to hide certain information from a friend or relative are smaller, which reduces information asymmetries. Secondly, referrers carefully assess the fit of the potential applicant and the organisation as well as the job in order to maintain their own reputation. Frequent recommendations of low-quality applicants are likely to harm the reputation of the referrer

⁴ These aspects determine the degree of P-J respectively P-O fit.

within the firm.⁵ Consequently, referrers do not spread information about job vacancies throughout their whole network but address high-quality workers personally. If this is the case, referrals are expected to promote high-quality workers and not just to place friends or family members into jobs. Pre-screening of potential applicants could therefore explain higher starting wages of new entrants. If employers anticipate the higher quality of applicants selected by their employees, higher wages for those hired via referrals are rational. Furthermore, new entrants of the firm could be more satisfied with working conditions if the referrer considers the preferences and abilities of the particular applicant.

Based on job search models that incorporate alternative search strategies, e.g. on vs. off-the-job (Burdett, 1978) or through different search channels (Holzer, 1988) further conclusions can be made for subgroups of job seekers. Both models suggest that job seekers adjust their job search in such a way that individuals maximise their expected utility, i.e. the difference between benefits and costs of search. Based on human capital theory it can be argued that this differential increases with the level of human capital since individuals earn higher wages and are likely to find a job more easily. Low educated job seekers, in turn, are likely to give up search or reduce their search effort due to small monetary benefits and higher search costs. Under the assumption that job search via social ties is able to reduce search costs, it can be argued that disadvantaged individuals (e.g. lower educated or migrants) should particularly benefit from finding a job through this channel.

2.1.2 Selection Effects

In contrast to this deliberate selection process, potential unconscious selection into sources due to **Individual Differences** appears plausible as well. Schwab (1982) argued that employees recruited by various channels might belong to different populations of applicants. According to this hypothesis, recruiting sources will yield applicants that differ systematically in job-relevant characteristics. For example, younger workers could be more likely to find their jobs via formal channels due to lower levels of social capital accumulated during their lifetime (Breaugh, Mann, 1984). If this is the case, lower wages of formal recruitments are not a result of source-specific effects, but of age differences as younger employees are generally associated with lower wages (e.g. due to seniority wages or a lower level of human capital). Furthermore, this age effect can also explain higher turnover rates caused by formal

⁵ Winter (1997) discussed the reputation calculus of the referrer by modelling a trade-off between reputation loss and gratitude gains (gratitude expressed by the referred person). In certain cases, maintaining one's own reputation might be valued less than referring a person which generates a huge gratitude gain. For instance, parents could gain an enormous gratitude gain if they find a job for their unemployed children.

recruitments since younger employees are generally associated to higher turnover, also called job shopping (Johnson, 1978). Therefore, the empirical results should convey no significant impact of recruitment channel usage on wages, if demographic, firm-, and job-specific variables are implemented as controls. The same logic holds true for the source effect on job satisfaction. If older job seekers utilise their contacts more frequently, an increase in job satisfaction can be explained by age effects (e.g. experience).

2.2 Monetary Post-hire Outcomes of Social Capital

So far, only few studies have explicitly investigated the explanatory power of the two alternative hypotheses. Breugh (1981) found no differences concerning demographic factors such as age, sex, years of education, and tenure in his case study. Taylor and Schmidt (1983) explicitly investigated the individual difference hypothesis including additional variables like weight, height or shift preference. The authors only found significant results for workers that were rehired by their former employer, whereas differences in demographic factors between other recruitment sources were not statistically significant. According to Breugh and Mann (1984) using a rather small sample of 98 social service employees the RJP hypothesis received more support than the Individual Differences hypothesis. Participants were asked about the quality of ex-ante information on job characteristics and requirements. Those who found their job through informal means reported that they disposed of significantly better information compared to newspaper adverts or direct applications. However, the Individual Differences hypothesis has been investigated on a small set of demographic variables (gender, race, education, age) and two constructs (ease of movement, applicant's abilities).

Most studies in this field of research build on the RJP or pre-screening hypotheses and investigate if social ties yield employees who perform better or realise higher post-hire outcomes. Performance as an outcome of job channels has been investigated by Pesek and McGee (1988), Kirnan et al. (1989), and Williams et al. (1993). These three studies found that social ties yielded ex-ante better applicants; however, individuals did not differ much in terms of performance. This indicates that social ties affect the quality of the applicants' pool but not performance after the hiring decision.

Later studies found mixed results regarding wages and provide different explanations for their findings. Boxman et al. (1991) analysed a set of 1,359 Dutch managers and found a positive relationship between social capital and earnings. They detected that human capital and social capital can serve as substitutes and that social capital is helpful at any level of human capital.

Based on 209 observations of male employees of a manufacturing firm in Egypt, Antoninis (2006) found that social ties are not per se helpful in finding a better paid jobs. Whereas, a referral by an individual with a valid estimate of a job seeker's skills was associated with higher earnings, referrals from friends or family members were negatively related to wages.

Bentollila et al. (2010) found a negative relationship between finding a job via social ties and wages with both US and European data. The authors assumed that job seekers who find a job via social ties do not work in the jobs in which they have a competitive advantage but in jobs their ties would like them to work. They interpreted social ties as a source of social pressure which makes job seekers accept jobs they would not accept without.

Pellizzari (2010) provided cross-country evidence on the wage effect of finding a job via informal means for 15 countries based on the European Community Household Panel. Both wage premiums and wage penalties were equally observable across countries which can be explained by differences in the effectiveness of formal search channels. For Germany, the author detected a wage penalty of $-.086$ without job characteristics and $-.043$ with job characteristics (OLS). In an additional fixed-effects regression, this wage penalty shrank and became statistically insignificant.

The study which is most closely related to the investigation in this article has been conducted by Delattre and Sabatier (2007) who analysed the wage effects of finding a job via one's social network or without in France. The authors applied switching regression models in order to account for endogeneity in finding a job via formal/informal means and the wage determination. They detected a meaningful selection effect for finding a job via social ties and after correcting for this selection bias the relationship between social networks and wages became negative. The most recent study is provided by Plug et al. (2015), who analysed the relationship between parental networks and children's labour market outcomes. The authors did not find significant wage effect. Parental networks, though, had a weak impact on occupational choice of children entering the labour market.

This review of the related literature shows that results are largely heterogeneous in terms of monetary outcomes. While early studies (mainly for the US labour market) report a positive correlation between finding a job via social ties and performance, other studies were not able to show that this is compensated by firms. Even more, recent studies in European countries have revealed that the wage effect diminished or even turned negative. Korpi (2001) explained this by stronger labour market institutions compared to the U.S. This is in contrast

to theoretical considerations of chapter 2.1 that social capital might overcome information asymmetries and that matching bonuses are shared between employer and employee. In the introduction it has been argued that the German labour market differs in many aspects from the US labour market and is commonly regarded as rather inert (Kemmerling, Bruttel, 2006). Furthermore, it appears questionable that employers are able or willing to differentiate between employees hired through different channels, particularly in Germany where wage postings and collective bargaining are important factors of wage determination (Brenzel et al., 2014). Thus, positive wage effects of finding a job via social ties are, according to the existing empirical evidence, rather unlikely and it is hypothesised:

H1 (Wage): Employees who found their jobs via social ties do not earn higher wages (not testable) or even lower wages compared to those who found their job via formal means.

2.3 Non-monetary Post-hire Outcomes of Social Capital

Few studies investigate the relationship between recruitment channels and *non-monetary* outcomes. As an example of early evidence, Latham and Leddy (1987) analysed a sample of 68 car dealers recruited via newspaper adverts, unsolicited applications, and social ties. They found that social ties yielded employees which showed higher job involvement, organisational commitment, and job satisfaction compared to those recruited via newspaper adverts. Moser (2005) analysed a set of 767 new employees of a large German electronic company to investigate the relationship between formal/informal channels and non-pecuniary outcomes (job satisfaction, organisational commitment). Special emphasis was laid upon the role of unmet expectations (as the inverse of realistic job previews) as a mediator between social ties and post-hire outcomes. The results indicated that finding a job via informal means was negatively related to the number of unmet expectations (measured as 48 dummies of pre-hire expectations) and that unmet expectations mediated the relationship between informal search and non-pecuniary outcomes. Franzen and Hangartner (2006) showed that finding a job via social ties was positively related to non-monetary outcomes. Based on a sample of 8,000 Swiss university graduates, the authors provided evidence that social networks help finding a job related to the job seeker's educational degree and better career chances.

Using a sample of 1,100 German low-skilled or long-term unemployed who re-entered the labour market, Krug and Rebien (2011) found no evidence for a wage premium of finding a job via informal means and only little evidence for a positive relation between social ties and non-monetary outcomes (job and task satisfaction, employment stability) utilising a propensity score matching approach.

To capture potential non-monetary benefits, the correlation between source of information and job satisfaction is investigated. If the use of informal means improves the matching quality employees are likely to be more satisfied with working conditions. Furthermore, an adequate preview of the contemplated job offer protects applicants against major disappointments yielding to an ex-post higher job satisfaction. Thus, it can be assumed that:

H2 (Job satisfaction): Employees who found their jobs via social ties report higher job satisfaction compared to those who found their job via formal means (wages kept constant).

Whereas job satisfaction describes the feelings or attitudes an employee has towards his/her job, turnover describes the actual decision to leave the current job (voluntary turnover) or the fact of being dismissed by the employer (involuntary turnover). Mobley et al. (1979) categorised determinants of turnover as individual demographics, job satisfaction, organisational and work environment factors, job content, and external environment factors. Differences in turnover can be explained by realistic job previews and matching theory. It has been argued that finding a job via social ties is likely to provide more valuable information on job characteristics. Such information benefits are likely to increase P-O and P-J fit, which results in better performance and higher job satisfaction. Employees who are performing better than their co-workers are less likely to be fired, even in economic downturns. Furthermore, more satisfied employees are less likely to quit the current job voluntarily.

The RJP hypothesis postulates that individuals, who found a job via social ties, dispose of more realistic expectations towards the job. Moreover, Porter and Steers (1973) found that unmet expectations, which is the perceived mismatch between expectations and work reality, are a potential source of dissatisfaction and, thus, turnover. Finding a job via social ties is likely to reduce the degree of unmet expectations and, therefore, turnover probability of new hires. Williams et al. (1993) investigated whether job search channels affected the turnover probability (after one year) of nurses. Their findings indicated that turnover was positively related to employee referrals. However, the authors argued that due to few control variables, a large number of variables that are likely to affect turnover have been omitted.

Moreover, turnover might be a more reliable measure for matching quality since both wages and satisfaction might be biased as a result of a job change. Starting wages might not contain performance contingent wages since performance cannot be observed directly after a job change. Job satisfaction after a job change might be biased upwards due to the so-called “honeymoon effect” (Boswell et al., 2005). The better the matching quality, the less likely an

employee is dismissed or quits the job voluntarily. Lambert et al. (2001) found that the work environment was an important factor in determining job satisfaction and turnover. Therefore, employees should be more likely to quit an organisation if the working conditions do not match the employee's abilities or ex-ante aspirations. As it is assumed that finding a job via social ties is likely to result in a better match, the following hypothesis is formulated:

H3 (turnover): The turnover ratio of employees who found their jobs via social ties is lower compared to those who found their job via formal means.

In the next chapter, these three hypotheses are investigated empirically to find out if social networks serve as beneficial in the job search process. Furthermore, the analysis is able to show which of the two alternative theories – namely Individual Differences and Realistic Job Previews – is able to explain recruitment source differences.

3 Dataset and Methodology

The dataset used for this study is derived from the German Socio-Economic Panel (SOEP), a longitudinal survey conducted annually by the German Institute of Economic Research (DIW) since 1984 in West Germany. After the German reunification the sample was enlarged by East German adults. Meanwhile, the survey includes a sample of 11,000 households and 20,000 randomly selected representative individuals covering a wealth of retrospective information on topics such as household composition, occupational biographies, employment status, and demographic characteristics.⁶ In this paper, data from the years 1999 to 2011 are used to investigate the use of recruitment sources over the last twelve years. For the years before 1999, there are only few observations on job search on the internet so that these years have not been considered in the analysis. The next part of this chapter presents some general statistics that describe the structure of the data and independent variables. Hereafter, the dependent variables and the methodology applied in this study are described.

3.1 Job Finding Channels in Germany

The variable of interest in this article is the search channel through which the respondent has found the current job, given that he or she changed the job. In each wave of the SOEP data, respondents who answered that they changed their job in the last year were asked: “How did you find out about this job?”⁷ Participants of the survey could choose between various kinds

⁶ The data used for this survey is derived from the 28th wave of the SOEP (doi: 10.5684/soep.v28). See Wagner et al. (2007) for an overview of the evolution of the SOEP.

⁷ The questions were initially asked in German. The English translation is taken from the official translation which is available on the website <http://www.diw.de/de/soep>.

of public employment agencies,⁸ private recruitment agencies, newspaper advertisements, internet advertisements, friends or relatives, returning to a former employer, and “other”. Respondents are asked to check only one of the given answers, naming the option that was responsible for finding out about the current job.

Chart 1 gives an overview of the relative importance of information sources between 1999 and 2011.⁹ Finding a job via social ties is a widespread phenomenon in Germany. About one third of the employees found their new jobs via referrals.¹⁰ Newspaper adverts became less relevant over the years as the share of job seekers who found a job via newspaper adverts decreased from above 20 percent to 12 percent. Public employment offices are responsible for placing about 10 percent of the sample into new jobs. A notable development is the sharp increase of employees who found their jobs on the internet from less than 1 percent in 1999 to 12 percent in 2011. Private employment agencies play a minor role in retaining people into employment and are therefore not further considered. Between 10 and 15 percent answered that they were rehired by their former employer (e.g. seasonal workers working for the same employer). Other sources like job fairs, temporary work agencies, headhunting, and unsolicited walk-ins are sampled in one category (“others or does not apply”). As these information channels are largely heterogeneous, they are not under investigation. Thus, this article focusses on the four most important information sources: social ties (to friends, relatives or acquaintances), internet and newspaper adverts, and public employment agencies.

Since formal channels differ in the way they reach potential applicants, e.g. due to their regional, national or international coverage, they address a different part of the population of job seekers (Schwab, 1982). For example, public employment agencies serve a distinct segment of the labour market characterised by low wage jobs and less educated job seekers (Osberg, 1993). Additionally, search via other sources requires a higher amount of initiative of the job seeker (Blaschke, 1987), which could lead to differences in the effectiveness of formal sources. Furthermore, differences between newspaper and internet adverts might derive from the nature of these channels. Whereas newspapers might contain mainly local or regional job offers, internet adverts are available to a virtually everyone who reads the advert.

⁸ Since these public employment institutions were reorganised in several reforms, all these agencies are summarised under the label “public employment agencies” and can be further divided into employment offices (“Agentur für Arbeit”), public personnel service agencies (PSA, which has the character of a temporary employment agency), and job-centres (“Jobcenter”, for those receiving welfare benefits). As the latter two only play a minor role in placing people into jobs, all three categories are summarised into one group.

⁹ Chart 1 contains observations of the whole SOEP data, not only the observations used in this analysis.

¹⁰ This is merely in line with Bachmann and Baumgarten (2013) who compared the use of recruitment channels in Europe. For Germany, they found that 39 percent of unemployed job seekers used friends, relatives or trade unions in order to find a job in the years 2006-2008. Note that multiple answers were possible.

As a result, the distinction between formal and informal channels is considered as too broad so that formal means are distinguished.

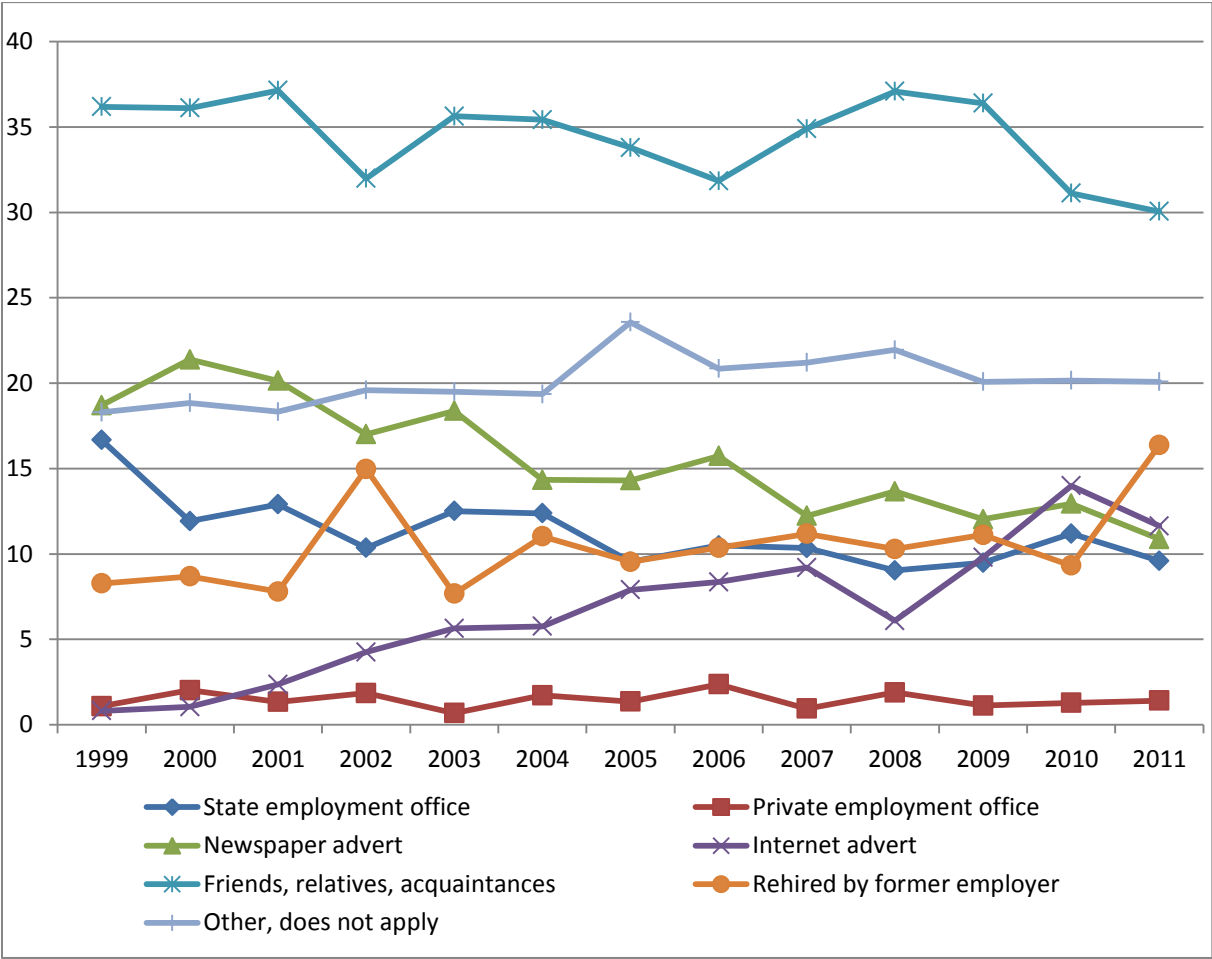


Chart 1: Use of selected recruitment sources from 1999 to 2011 (in percent)

(Source: own calculations based on SOEP data)

For the multivariate analyses in this article, the data has been limited to the working population aged 18-65; self-employed workers and the agricultural sector have been excluded due to their low economic relevance. Job seekers who have found a job through a job creation scheme (Arbeitsbeschaffungsmaßnahme, 1-Euro-Job) are not considered in this sample. Further observations had to be deleted due to missing data. This reduced the sample size to 2,798 individuals who changed their jobs and account for a total sum of 3,818 job changes. Hence, in average, each individual changed his or her job about 1.36 times. About 11 percent of the individuals appear just once in the data; about 10 percent changed their jobs more than five times. This indicates that job changes are rather infrequent in Germany. Individuals with more than 8 changes in the observation period have been deleted from the dataset because individuals which change their jobs that often might differ from the other job seekers in the sample. Since observations are deleted in case of missing variables or if the job change

occurred through another than the sources under investigation, not every change of each individual is in the dataset. Furthermore, observations have been deleted if information on earnings and job satisfaction is missing or if data on earnings and job satisfaction of the previous year is missing. As a result, the data contains only observations of job seekers who were unemployed for less than a year.

3.2 Control Variables

The independent variables used in this analysis are divided into four categories: demographics, search behaviour, job-related variables, and regional variables. Demographics include variables typically used in multivariate analyses on the individual level, such as *gender* (dummy), *age* (in years), *years of formal education*, *marital status* (dummy), if *children are living in the household* (dummy), and *immigrant* status (not born in Germany, dummy).

Three variables describe the conditions under which job seekers searched for the current job. First, a dummy variable (*unemployed before*) indicates if the individual directly changed from one job to another or if the individual entered the job from unemployment.¹¹ Hence, this variable can be interpreted as on respectively off-the-job-search. Culminated *years of unemployment experience* is a generated variable provided in the SOEP data which summarises all unemployment spells of an individual. The third variable describes if an individual was *actively searching* for a job or if the new position “just came up”.

The position the job seeker found is described by six variables: *branch*, *firm size*, *occupation*, *public sector*, *working hours*, and fixed term (*limited*) contract. Branch includes five categories, such as industry, manufacturing, trade, finance, and service. The size of the firm the new job is found in is measured by the number of employees which is divided into four categories. An individual’s occupation is coded according to the International Standard Classification of Occupations (ISCO) provided by the International Labour Organization of the United Nations Organization. Apart from the respective tasks and the necessary education, the ISCO code contains information on hierarchy levels. For this analysis, the first digit of the code is used as a broad measure for an individual’s occupation and hierarchy. A dummy variable reflects if the new job is found in the public sector. The number of working hours is measured on a weekly basis, including potential overtime hours. Last, a variable comprises whether the new employment contract has a limited or unlimited duration.

¹¹ This dummy variable takes the value zero when the job was found without interim unemployment and 1 if the job was found after a period of unemployment. Interim unemployment has been identified by an increase in the variable measuring overall unemployment experience.

On the regional level, the *regional unemployment rate*, the *regional gross domestic product* (per capita), and the region (*East/West*) are included as variables. The regional unemployment rate and the regional GDP are given as the yearly average in each federal state. The GDP is used as a per capita measure in order to account for the number of inhabitants in the respective state. The last dummy indicates whether an individual is residing in Eastern or Western Germany, while Berlin is classified as “East”.

An overview about the variables used in the investigation can be found in Table 1. As mentioned above, the four most commonly used recruitment sources are left in this sample. Therefore, half (54 percent) of the job changes occurred after referrals. Newspaper adverts were responsible for 26 percent of all job changes, employment offices and internet adverts were used less often (9 respectively 12 percent). The dataset comprises an equal number of male and female job changers with an average age of 37 years of which around 12 years are spent in education. 51 percent of the respondents are married and 30 percent have at least one child living in their household. One fourth of the job changers were unemployed before finding a job. In average, each individual experienced 0.9 years of unemployment in their working life and more than 60 percent were actively searching for a new job.

Regarding different branches, service (27 percent), trade (26 percent), and industry (24 percent) account for most of the job changes. Less jobs are found in the finance (17 percent) and manufacturing (7 percent) sector. With reference to firm size, most job changes occurred in small firms with less than 20 employees (38 percent). Only one third of the job seekers found their jobs in companies with more than 200 employees. Less job changes happen on the highest level (5 percent), most changes are reported for technicians and associate professionals (23 percent). All other job categories account for 9 to 16 percent of the job changes. 14 Percent of the job changers are working in the public sector. In average, employees of the dataset work 38 hours per week and 18 percent of job seekers found jobs with fixed term contracts. The average (unweighted) regional unemployment rate is 9.60 percent and the average (unweighted) GDP per capita is 27,000 euros. 22 percent of the job changers are residing in East Germany.¹²

¹² About 21 percent of the working population live in East Germany (Destatis, 2010).

Table 1: Dataset overview

Variable	Obs.	Mean	Std. Dev.
<u>Recruitment source</u>			
Referrals (1=yes)	3,818	0.539	0.499
Newspaper (1=yes)	3,818	0.262	0.440
Employment office (1=yes)	3,818	0.085	0.278
Internet (1=yes)	3,818	0.114	0.318
Gender (1=female)	3,818	0.505	0.500
Age	3,818	36.588	9.585
Years of education ^A	3,818	12.463	2.575
Married (1=yes)	3,818	0.512	0.500
Children in household (1=yes)	3,818	0.295	0.456
Immigrant (1=yes)	3,818	0.089	0.284
Unemployed before (1=yes)	3,818	0.230	0.421
Total years of unemployment	3,818	0.888	1.719
Actively sought (1=yes)	3,818	0.623	0.485
<u>Branch</u>			
Industry (1=yes)	3,818	0.235	0.424
Manufacturing (1=yes)	3,818	0.072	0.259
Trade (1=yes)	3,818	0.259	0.438
Finance (1=yes)	3,818	0.166	0.372
Services (1=yes)	3,818	0.268	0.443
<u>Firm size</u>			
less than 20 (1=yes)	3,818	0.379	0.485
20 to 199 (1=yes)	3,818	0.313	0.464
200 to 1999 (1=yes)	3,818	0.165	0.371
more than 2000 (1=yes)	3,818	0.143	0.350
<u>ISCO job classification</u>			
Legislators, senior officials and managers (1=yes)	3,818	0.047	0.212
Professionals (1=yes)	3,818	0.136	0.342
Technicians and associate professionals (1=yes)	3,818	0.232	0.422
Clerks (1=yes)	3,818	0.117	0.321
Service workers (1=yes)	3,818	0.153	0.360
Craft and related trade workers (1=yes)	3,818	0.150	0.357
Plant and machine operators (1=yes)	3,818	0.077	0.267
Elementary occupations (1=yes)	3,818	0.088	0.283
Public sector (1=yes)	3,818	0.138	0.345
Working hours per week	3,818	37.635	13.362
Limited contract (1=yes)	3,818	0.180	0.385
Regional unemployment rate (in %)	3,818	9.60	4.10
Regional GPD per capita (in 1,000 €)	3,818	27.070	5.988
East Germany (1=yes)	3,818	0.223	0.417

Note: A = Years of education is variable provided in the SOEP sample. 13 years of schooling reflect a high school degree, whereas no degree is interpreted as 7 years of education. 18 years refer to a university degree. For a detailed description of the generation of this variable see SOEP Group (2015).

3.3 Dependent Variables and Methodology

In this article, three different dependent variables are used to measure post-hire outcomes of finding a job via social ties: wages, job satisfaction, and turnover. In this chapter it is

described how these variables are measured and which methodology is applied in order to estimate the relationship between job finding channels and the respective outcome variable.

Wages

Wages are estimated as the gross monthly labour income in prices of 2010.¹³ It is assumed that the determination of wage income follows the logic of the Mincerian earnings regression where *logarithmised wage* acts as the dependent variable. The model can be described by

$$\text{Log}(W_{it}) = \alpha + \text{SOURCE}'_{it} \cdot \beta + \text{Dem}'_{it} \cdot \gamma + \text{Lab}'_{it} \cdot \delta + \text{Job}'_{it} \cdot \epsilon + \text{Reg}'_{it} \cdot \zeta + \theta \quad (1)$$

where α stands for the intercept. SOURCE stands for a set of recruitment channel dummies (newspaper adverts, public employment agencies, internet adverts) which take the value “1” if the job was found through that particular source and “0” if not. If all dummies simultaneously take the value “0”, the job seeker has been successful via friends/relatives. *Dem* is a vector of demographic control variables, *Lab* comprises variables which describe search and labour market experience. *Job* stands for a set of job- and firm-specific indicators (firm size, branch, occupation). Regional differences like an East/West dummy and regional unemployment rate and GDP are part of the *Reg* vector. θ is the error term.

The regression model above describes the relationship between the recruitment channel the job was found through and the current monthly wage. Since unobservable factors, such as motivation or ability, are likely to affect wages (and also search effort), the difference between the current and the previous salary is of interest. Wage differentials between individuals who earned less in their previous jobs (e.g. due to unobservable individual characteristics) are likely to earn less in their current jobs as well. If less able or less motivated individuals are more likely to find their jobs through a certain channel, wage differentials between channels are likely to be overestimated. In order to control for the possibility that job seekers who used a specific search channel systematically gained higher wages in their former job, another regression approach is applied. In the following model

$$\Delta W_{it} = W_{it} - W_{i,t-1} = \alpha + \text{SOURCE}'_{it} \cdot \beta + \text{Dem}'_{it} \cdot \gamma + \text{Lab}'_{it} \cdot \delta + \text{Job}'_{it} \cdot \epsilon + \text{Reg}'_{it} \cdot \zeta + \theta \quad (2)$$

ΔW represents wage income changes computed as the difference between the current wage after the job change and the wage paid in the former job. All independent variables on the right side remain the same as in Equation (1).

¹³ The SOEP data provides the generated variable LABGRO\$\$ which contains all types of gross income. See SOEP Group (2015) for a description of generated variables provided in the SOEP data.

Job Satisfaction

Job satisfaction (JS) is measured by a single question (“How satisfied are you are with your job?”) on a 11-point Likert scale ranging from 0 (lowest satisfaction) to 10 (highest satisfaction).¹⁴ Hamermesh (1978: 54) defined job satisfaction as an “individual’s response to a specific question designed to elicit his feelings about the job as a whole”. This definition implies that individuals are able to express a general feeling towards their current job which is affected by various aspects of the job.¹⁵ The estimated model can be described by

$$JS_{it} = \alpha + SOURCE'_{it} \cdot \beta + Dem'_{it} \cdot \gamma + Lab'_{it} \cdot \delta + Job'_{it} \cdot \epsilon + Reg'_{it} \cdot \zeta + Sat'_{it} \cdot \eta + \theta \quad (3)$$

which is largely similar to equation (3). Here, coefficient matrix β contains the effect of the source the applicant was recruited through on the employee’s wage. *Sat* contains additional variables that are likely to affect job satisfaction, such as health status (five categories), perceived job insecurity (three categories), and wage income.

Like wages, job satisfaction is likely to be determined by unobserved job characteristics and by external effects from the private domain which spill-over on job satisfaction (Judge, Watanabe, 1994; Rode, 2004). In addition, in contrast to wages, job satisfaction resembles a subjective measure of job quality. Most likely, different individuals evaluate identical jobs differently because each individual associates a certain standard with a certain value on the Likert scale. If job seekers who find a job through a certain channel systematically rate jobs lower than other employees, this might affect the results of the study. Hence, estimating the relationship between recruitment channels and the difference in job satisfaction is likely to reduce such bias because ratings are more likely to be consistent within individuals than between individuals. Therefore, the satisfaction differential ΔJS between the current and the previous job is estimated by

$$\Delta JS_{it} = \alpha + SOURCE'_{it} \cdot \beta + Dem'_{it} \cdot \gamma + Lab'_{it} \cdot \delta + Job'_{it} \cdot \epsilon + Reg'_{it} \cdot \zeta + Sat'_{it} \cdot \eta + \theta \quad (4)$$

where there independent variables are the same as in equation (3).

This study provides different regression models to detect the causal relation between the successful recruitment source and labour market outcomes as well as factors that determine the use of particular recruitment sources. First standard pooled OLS models are applied to

¹⁴ Albeit single-item measures in contrast to multi-item constructs show weaker validity and reliability, Wanous et al. (1997) as well as Dolbier et al. (2005) supported the applicability of a single single-item measures of job satisfaction. The authors, furthermore, stressed the advantages of single-time measures such as easier understanding of participants and a more convenient interpretation of score changes.

¹⁵ Locke (1976) mentioned the job dimensions work, pay, promotions, recognition, benefits, working conditions, supervision, co-workers, company and management as determinants of overall job satisfaction.

calculate cross-sectional effects. An additional median regression, which is more robust regarding outliers, is applied to evaluate relative wage increases. To cover the ordinal nature of the job satisfaction variable, ordered logit or probit models are suggested by the literature. However, Ferrer-i-Carbonell and Frijters (2004) argued that the assumption of cardinality or ordinality of general satisfaction does not lead to meaningful differences of the results. Therefore, and as OLS results are more convenient to be interpreted, linear regression models are used in this study. Additionally, Ferrer-i-Carbonell and Frijters (2004) stated that controlling for time-invariant unobserved factors affects the results most. By implementing fixed- and random effects panel estimators the longitudinal character of the data is exploited.

Moreover, since both wages and job satisfaction are outcome variables of the job domain and are mainly influenced by similar factors, error terms of the two separate regressions might be correlated. In this case, a seemingly unrelated regression approach (Zellner, 1962; Zellner, Huang, 1962; Zellner, 1963) might yield more robust results. In order to estimate the model, both regressions are calculated simultaneously and both regressions contain the same variables described in the job satisfaction regression.

Turnover

Turnover (TO), which comprises voluntary job leave and dismissals, is measured on a yearly base for the five following years after a job change. A dummy variable is created which takes the value “1” if the individual changed its job again or became unemployed in the respective year (or in the previous year(s)). Due to the unbalanced nature of the SOEP, each year more observations are getting lost by increasing the time horizon of measurement. As turnover is measured as a simple dummy variable, five binomial logit models are estimated. The model estimates the probability that an individual i has changed the job or has become unemployed (summarised as turnover) in a particular year x after finding the job. Control variables are the same as in the job satisfaction regressions (equation 3 and 4). The regression contains the same variables as the job satisfaction regression above. In a robustness check, job satisfaction and wages are included in this regression.

$$Pr(TO_{i,t+x} = k) = \alpha + SOURCE_{it} \cdot \beta + Dem'_{it} \cdot \gamma + Lab'_{it} \cdot \delta + Job'_{it} \cdot \epsilon + Reg'_{it} \cdot \zeta + Sat'_{it} \cdot \eta + \theta, \quad (x \in 1,2,3,4,5) \quad (5)$$

$$\text{With } k = \begin{cases} 0 & \text{no (job change and not unemployed)} \\ 1 & \text{yes (job change or unemployed)} \end{cases}$$

4 Empirical Evidence

This chapter presents empirical evidence on the post-hire outcomes of job search via social ties. First, descriptive statistics on the three measures of labour market success are presented. Second, multivariate results are shown.

4.1 Descriptive Statistics

Table 2 contains descriptive results on wages and job satisfaction as a result of finding a job via one of the four channels. Regarding gross income, the table shows that finding a job via social ties is linked to lower wages compared to finding a job via newspaper or internet adverts. The difference is meaningful in size (239 respectively 608 euros per month) as well as highly significant. However, those who found their job with the aid of employment agencies earn significantly lower wages. In contrast to this, the results regarding job satisfaction show that individuals who were successful via social ties are more satisfied with their jobs, statistically significant for employment offices and internet adverts. Although empirical studies do not deliver clear evidence on the correlation between pay and job satisfaction (see Judge et al., 2010 for a meta-analysis), it is quite astonishing that higher wages seem to coincide with lower degrees of job satisfaction. This could be an indication that seekers face a trade-off between wages and job satisfaction and that individuals who search for a job via social ties lay more emphasis on satisfaction than on wages.

The results on wage and job satisfaction changes compared to the former job are less significant than the previous findings. The increase in monthly wages is higher for job seekers who were successful via internet adverts. The increase in job satisfaction is much lower for those who found a job via employment agencies. All other findings are insignificant.

Table 2: Descriptive results of job satisfaction, income, and wages of different recruitment channels

		Friends/relatives	Newspaper	Empl. office	Internet
Gross income	AM	1,982.95	2,219.65***	1,808.44*	2,590.52***
	Std. Dev.	(1,298.83)	(1,379.35)	(924.14)	(1,358.86)
Job satisfaction	AM	7.300	7.185	6.923**	7.126
	Std. Dev.	(1.983)	(2.059)	(1.985)	(2.171)
Change gross income (€)	AM	128.40	116.24	111.28	274.56**
	Std. Dev.	(859.670)	(749.405)	(711.753)	(900.800)
% change in gross income	AM	0.417	0.248*	0.478	0.483
	Std. Dev.	(2.119)	(0.909)	(1.973)	(1.416)
	Med.	0.039	0.042	0.020	0.065
Change job satisfaction	AM	0.711	0.676	0.152***	0.874
	Std. Dev.	(2.670)	(2.694)	(2.637)	(2.985)
Observations		2,057	1,001	323	437

Notes: Arithmetic means, standard deviations in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively, of t-tests for differences in means compared to friends/relatives. Income and wage are in prices of 2010.

Additionally, Table 3 contains information about turnover after one to five years after the job was found. The findings reveal that turnover ratios are similar between individuals who found their job via social ties and via employment agencies. Compared to the reference group, finding a job via newspaper adverts is related to lower turnover ratios in all years apart from the first year after the job change. Those who found their jobs on the internet are more likely to change jobs in all years after the second year.

Table 3: Turnover ratios by recruitment source

	Friends/relatives	Newspaper	Empl. office	Internet
Turnover after one year	0.336 (0.473)	0.329 (0.470)	0.353 (0.479)	0.350 (0.478)
Observations	1,914	952	303	380
Turnover after two years	0.495 (0.500)	0.447* (0.497)	0.542 (0.499)	0.544 (0.499)
Observations	1,799	902	286	327
Turnover after three years	0.536 (0.499)	0.482** (0.500)	0.579 (0.495)	0.623** (0.485)
Observations	1,679	868		297
Turnover after four years	0.598 (0.490)	0.532** (0.499)	0.615 (0.488)	0.691** (0.463)
Observations	1,572	827	262	285
Turnover after five years	0.652 (0.476)	0.580*** (0.494)	0.679 (0.468)	0.774*** (0.419)
Observations	1,484	797	246	261

Notes: Arithmetic means, standard deviations in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively, of t-tests for differences in means compared to friends/relatives.

Table 4 delivers a first glance on socio-demographic and search behavioural differences of employees with respect to recruitment channels. The table contains arithmetic means of the respective determinants and a t-test is conducted to reveal whether mean values are significantly different from the base category “finding a job via friends or relatives”. As the results indicate, women are more likely to find a job via newspaper adverts than via informal means. Individuals who found a job via internet adverts are younger and less likely to be married in comparison to the reference group. Those who found their jobs with the aid of employment agencies are less educated than the reference group; whereas, job seekers who were successful via newspaper or internet adverts are more educated. Individuals who found a job via newspaper adverts are less likely to live with children under 18 in the household. Immigrants are less likely to find a job via newspaper or internet adverts.

Table 4: Descriptive statistics on socio-demographic and job search characteristics by search channel

	Friends/relatives	Newspaper	Empl. office	Internet
Gender (1=Female)	0.484 (0.500)	0.558*** (0.497)	0.502 (0.501)	0.485 (0.500)
Age	36.722 (9.783)	37.267 (9.177)	35.687 (10.302)	35.066*** (8.799)
Years of Education	12.169 (2.485)	12.632*** (2.514)	11.844* (2.210)	13.915*** (2.816)
Married (1=yes)	0.531 (0.499)	0.555 (0.497)	0.424*** (0.495)	0.387*** (0.488)
Children in HH (1=yes)	0.313 (0.464)	0.256*** (0.436)	0.303 (0.460)	0.293 (0.456)
Immigrant (1=yes)	0.099 (0.299)	0.073* (0.260)	0.102 (0.303)	0.066* (0.249)
Unemployed before new job (1=yes)	0.197 (0.398)	0.203 (0.402)	0.486*** (0.501)	0.259** (0.438)
Total years of unemployment	0.889 (1.693)	0.772 (1.614)	1.641*** (2.528)	0.592*** (1.059)
Actively sought (1=yes)	0.436 (0.496)	0.819*** (0.385)	0.858*** (0.350)	0.876*** (0.329)
Observations	2,057	1,001	323	437

Notes: Arithmetic means, standard deviations in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively, of t-tests for differences in means compared to friends/relatives.

Only 20 percent of the individuals who found a job through friends or relatives were unemployed before the new job. This share is significantly higher for employees who found their jobs via employment offices (0.486) and internet adverts (0.259). The overall unemployment experience of those who found their job via internet adverts is significantly lower compared to the reference group. On the contrary, individuals who were successful through employment agencies have been, in average, twice as long unemployed in their lives. Active search is strongly related to finding a job via formal channels. Whereas 44 percent of those who found their job via friends or relatives were actively searching for a new job, more than 80 percent of those who were successful via formal means sought actively. All in all, these findings indicate that employees who were found through different channels differ in many regards which could explain differences in post-hire outcomes. Therefore, multivariate analyses are used to control for these factors.

4.2 Multivariate Analyses

4.2.1 Wage Income

Albeit descriptive evidence above indicates differences in post-hire outcomes, those findings might be explained by the considerable differences in demographics (age, gender, education) or occupational choices of job seekers who found their jobs via different channels. Table 5

contains three models of pooled cross-sectional OLS regressions on monthly wage income.¹⁶ Model (1) provides a first impression of how the choice of recruitment channels affects wages. Results indicate that finding a job via newspaper or internet adverts yields a wage premium whereas job search through the public employment office does not affect wages. However, these coefficients should not be interpreted further because other factors that determine wages are ignored. Therefore, model (2) includes demographic characteristics such as years of education, gender, and age and, consequently, the source-related coefficients become smaller. Model (3) comprises additional branch- and job-specific as well as regional control variables. These controls reflect differences in jobs found via different search channels and regional factors, such as the unemployment rate. The results show that no significant wage differences occur between social ties, newspaper adverts, and employment offices. A wage premium, though, seems to be related to finding a job via internet adverts. Finding a job via internet adverts increases monthly wages by 5.34 percent.¹⁷ Both demographic and job-specific variables explain about 30 percent of the variance in wages resulting in a model fit of 66.6 percent in model (3).

Panel estimators can be applied to consider the time structure of the data (Model (4) and Model (5)). A fixed-effects estimator is applied to exclude time-invariant unobserved individual heterogeneity. Performing a Hausman test¹⁸ indicates significant differences between fixed and random-effects (GLS) estimators. Hence, fixed-effects models are preferred despite its lower efficiency. However, results of the random-effects estimators are displayed in Table 5 for the sake of completeness (Model (5)). Whereas the fixed-effects model yields no statistically significant source coefficient, the GLS model mainly replicates the previous findings.

However, panel estimators have to be interpreted carefully since fixed-effects estimators presume an adequate degree of variation. The coefficients are influenced by those employees who change their job at least twice and make use of different information channels in the observed time span. Multiple job changers might differ systematically from those who take just one job in the 13 year period. As the internet has become a frequently utilized search channel just recently, more changes can be observed for newspaper adverts. Hence, the insignificant internet coefficient might be caused by too few data for fixed-effects regressions.

¹⁶ As the dependent variable is logarithmised, coefficients have to be transformed by the exponential function to get the exact effects respectively differences. The table contains the estimated coefficients, whereas transformed figures are given in the text.

¹⁷ For comparisons: One additional working hour per week increases monthly wages by 3.46 percent.

¹⁸ $\chi^2=124.86^{***}$, H_0 (difference in coefficients is not systematic) has to be rejected.

In order to control for wage persistence, Table 6 contains empirical evidence on the impact of recruitment sources on wage increases (or decreases) compared to the previous job. Thus, regression results can be interpreted as a positive or negative wage increase in percent compared to the increase of the reference group (in prices of 2010). In the first three models, the relative wage increase (in percent) serves as the dependent variable. Compared to the base category, finding a job via newspaper adverts is associated with a 0.14 lower wage increase. Model (4) uses a median regression which is more robust with respect to outliers, which are quite frequent in the case of percentage wage increases (see descriptive evidence). In this regression, all job channel coefficients are statistically insignificant. This finding is robust if other quantiles than the median (e.g. .25 and .75) are defined. The last model (5) focusses on absolute wage changes (in euros) relative to the base category. Like in the previous regression, job channels are not related to wage differentials.

All in all, these findings imply that individuals who found a new job via newspaper adverts experience lower wage increases compared to the reference category. However, this difference disappears when the absolute increase is investigated. This could be explained by the fact that those who found a job via newspaper adverts already earned higher wages before the job change and that, therefore, relative changes are smaller. The total wage differential, however, is not affected by this.

Table 5: Mincer wage regression

DV: Monthly Income (log)	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)	
	OLS Base		OLS Demographics		OLS Full Model		Fixed Effects		Random Effects	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
<u>Recruitment Source (ref. social ties)</u>										
Newspaper (1=yes)	0.110***	(0.033)	0.110***	(0.027)	0.020	(0.019)	0.060	(0.031)	0.012	(0.019)
Employment office (1=yes)	0.026	(0.040)	0.069	(0.038)	0.014	(0.027)	0.027	(0.049)	0.013	(0.027)
Internet (1=yes)	0.425***	(0.038)	0.239***	(0.034)	0.052*	(0.026)	0.062	(0.041)	0.046*	(0.023)
Gender (1=female)			-0.628***	(0.025)	-0.155***	(0.023)				
Years of education			0.081***	(0.005)	0.035***	(0.004)	0.082*	(0.041)	0.040***	(0.004)
Age			0.061***	(0.009)	0.044***	(0.007)	0.048	(0.030)	0.047***	(0.007)
Age squared/100			-0.077***	(0.012)	-0.047***	(0.009)	-0.058	(0.036)	-0.051***	(0.008)
Married (1=yes)			-0.068*	(0.027)	-0.002	(0.018)	0.078	(0.057)	0.012	(0.019)
Child in HH (1=yes)			-0.156***	(0.033)	-0.028	(0.024)	0.019	(0.046)	-0.037	(0.022)
Immigrant (1=yes)			-0.056	(0.045)	0.005	(0.030)				
Actively sought for new job (1=yes)					0.004	(0.018)	-0.038	(0.028)	0.005	(0.017)
Unemployed before new job (1=yes)					-0.042*	(0.019)	-0.051	(0.031)	-0.033	(0.018)
Total years of unemployment					-0.033***	(0.007)	0.006	(0.037)	-0.037***	(0.007)
<u>Branch (reference: trade)</u>										
Industry (1=yes)					0.150***	(0.025)	0.063	(0.045)	0.153***	(0.024)
Manufacturing (1=yes)					0.173***	(0.033)	0.053	(0.066)	0.184***	(0.032)
Finance (1=yes)					0.100***	(0.027)	0.029	(0.043)	0.077**	(0.026)
Services (1=yes)					0.083***	(0.025)	0.050	(0.059)	0.057*	(0.026)
<u>Firm size (reference: less than 20)</u>										
20 to 199 (1=yes)					0.081***	(0.018)	0.067*	(0.030)	0.087***	(0.018)
200 to 1999 (1=yes)					0.177***	(0.023)	0.135***	(0.041)	0.184***	(0.022)
more than 2000 (1=yes)					0.143***	(0.027)	0.173***	(0.042)	0.171***	(0.026)
Limited contract (1=yes)					-0.073***	(0.022)	-0.091*	(0.036)	-0.088***	(0.022)
Working hours per week					0.034***	(0.001)	0.024***	(0.002)	0.035***	(0.001)
Public sector (1=yes)					0.055*	(0.026)	-0.037	(0.042)	0.046	(0.025)
<u>ISCO job class. (ref.: legislators, senior officials and managers)</u>										
Professionals (1=yes)					0.026	(0.071)	0.026	(0.053)	0.003	(0.045)
Technicians & associate prof. (1=yes)					-0.041	(0.067)	-0.021	(0.052)	-0.087*	(0.043)
Clerks (1=yes)					-0.115	(0.070)	-0.050	(0.062)	-0.169***	(0.048)
Service workers (1=yes)					-0.270***	(0.070)	-0.101	(0.069)	-0.303***	(0.050)
Craft and related trade workers (1=yes)					-0.161*	(0.072)	-0.049	(0.068)	-0.138**	(0.048)
Plant and machine operators (1=yes)					-0.308***	(0.074)	0.040	(0.085)	-0.236***	(0.051)
Elementary occupations (1=yes)					-0.383***	(0.074)	-0.125	(0.092)	-0.356***	(0.055)
East Germany (1=yes)					-0.058	(0.042)				
Regional unemployment rate (in %)					-0.019***	(0.004)	0.003	(0.012)	-0.024***	(0.002)
Year dummies		Yes		yes		yes		yes		yes
Constant	7.478***	(0.046)	5.683***	(0.175)	5.171***	(0.165)	4.621***	(0.783)	5.013***	(0.149)
(Adjusted) R ²	overall	0.051		0.327		0.666		0.554		0.658
	within							0.299		0.268
	between							0.572		0.6848

Notes: Estimations based on 3,818 observations. Individually clustered standard errors in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively.

Table 6: Wage difference regressions

DV: Difference in Monthly Income	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)	
	OLS Base		OLS Demographics		OLS Full Model		Median Regression		Absolute Increase	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
<u>Recruitment Source (ref. social ties)</u>										
Newspaper (1=yes)	-0.150**	(0.051)	-0.160**	(0.053)	-0.140*	(0.057)	0.000	(0.013)	-41.31	(30.65)
Employment office (1=yes)	0.064	(0.118)	0.044	(0.115)	-0.016	(0.123)	-0.007	(0.019)	-46.31	(42.94)
Internet (1=yes)	0.014	(0.090)	-0.026	(0.099)	-0.028	(0.095)	0.020	(0.017)	57.69	(49.14)
Gender (1=female)			0.168**	(0.059)	0.294***	(0.073)	0.070***	(0.013)	186.13**	(34.93)
Years of education			0.037	(0.021)	0.039*	(0.016)	0.000	(0.003)	8.96	(7.41)
Age			-0.075***	(0.020)	-0.084***	(0.021)	-0.018***	(0.004)	-49.58***	(9.90)
Age squared/100			0.086***	(0.025)	0.096***	(0.027)	0.019***	(0.005)	5.27***	(1.30)
Married (1=yes)			-0.063	(0.051)	-0.018	(0.056)	-0.004	(0.012)	-3.86	(32.19)
Child in HH (1=yes)			0.193*	(0.089)	0.222*	(0.093)	0.041**	(0.014)	122.51***	(35.22)
Immigrant (1=yes)			0.190	(0.201)	0.173	(0.205)	0.014	(0.018)	6.63	(48.39)
Actively sought for new job (1=yes)					-0.101	(0.074)	-0.016	(0.011)	-13.38	(29.77)
Unemployed before new job (1=yes)					0.152*	(0.066)	-0.026*	(0.013)	-42.87	(31.52)
Total years of unemployment					0.058*	(0.026)	0.007*	(0.003)	20.62**	(6.98)
<u>Branch (reference: trade)</u>										
Industry (1=yes)					0.126	(0.093)	0.030	(0.016)	121.02***	(38.07)
Manufacturing (1=yes)					-0.073	(0.084)	0.010	(0.024)	48.85	(60.10)
Finance (1=yes)					-0.075	(0.068)	-0.001	(0.017)	37.29	(44.04)
Services (1=yes)					0.009	(0.072)	0.011	(0.016)	57.19	(36.89)
<u>Firm size (reference: less than 20)</u>										
20 to 199 (1=yes)					-0.045	(0.065)	0.024	(0.012)	41.24	(32.54)
200 to 1999 (1=yes)					0.018	(0.127)	0.021	(0.016)	75.19	(44.03)
more than 2000 (1=yes)					-0.065	(0.085)	0.035*	(0.016)	83.38*	(41.29)
Limited contract (1=yes)					0.088	(0.102)	-0.006	(0.014)	-65.582	(35.82)
Working hours per week					0.009***	(0.002)	0.003***	(0.000)	10.34***	(1.39)
Public sector (1=yes)					0.055	(0.108)	0.020	(0.017)	44.369	(46.80)
<u>ISCO job class. (ref.: legislators, senior officials and managers)</u>										
Professionals (1=yes)					0.060	(0.176)	-0.017	(0.027)	-31.79	(104.52)
Technicians & associate prof. (1=yes)					-0.054	(0.116)	-0.034	(0.026)	-153.91	(96.75)
Clerks (1=yes)					-0.135	(0.117)	-0.027	(0.028)	-182.43	(94.08)
Service workers (1=yes)					0.005	(0.136)	-0.006	(0.028)	-129.90	(95.80)
Craft and related trade workers (1=yes)					-0.055	(0.106)	-0.011	(0.028)	-128.75	(94.54)
Plant and machine operators (1=yes)					-0.017	(0.116)	-0.007	(0.030)	-170.85	(101.50)
Elementary occupations (1=yes)					-0.015	(0.142)	-0.045	(0.030)	-167.80	(99.03)
East Germany (1=yes)					-0.058	(0.198)	0.016	(0.025)	23.24	(61.87)
Regional unemployment rate (in %)					-0.002	(0.021)	-0.002	(0.003)	-11.97	(6.80)
Year dummies		yes		yes		yes		yes		yes
Constant	0.219***	(0.051)	1.208**	(0.389)	0.991*	(0.472)	0.233**	(0.087)	743.66**	(234.31)
(Adjusted) R ²	0.008		0.019		0.030		0.014		0.064	

Notes: Estimations based on 3,818 observations. Individually clustered standard errors in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively.

4.2.2 Job Satisfaction

Table 7 again comprises three cross-sectional regression models and two models with panel estimators to assess the influence of recruitment source on job satisfaction. The first model contains only recruitment channel and year dummies. Although only the employment office coefficient is statistically significant, all coefficients indicate a negative relationship between formal information sources and job satisfaction. Controlling for individual demographics in Model (2) does not affect the results much. Including further job-related variables and a measure of health and perceived job security provide a detailed picture on the factors that influence job satisfaction. Results of Model (3) reveal that all three formal sources are associated with lower job satisfaction compared to social contacts; statistically significant for employment agencies and newspaper adverts. The overall model fit of roughly 14 percent for the third model indicates that there are unobserved characteristics that influence job satisfaction but have not been measured in the dataset.¹⁹

Exploiting the panel structure of the data by using fixed and random-effects estimators confirms these results in the broadest sense (see Model (4) and (5)). As the result of the Hausman specification test ($\chi^2=85.11^{***}$) indicates, the fixed-effects estimator is efficient and should be preferred compared to the random-effects estimator. However, the use of fixed-effects estimators must be criticised for the reasons stated above. The results show that all formal sources are negatively correlated with job satisfaction – in Model (4) statistically significant for employment agencies. Model (5) confirms the previous OLS regressions.

Table 8 comprises regression results for the job satisfaction differential before and after the job change. Coefficients measure the absolute change in job satisfaction after the job change relative to the reference category. Model (1), containing only recruitment source variables and year dummies, reveals a strong negative effect for the use of employment offices. The effect for newspaper adverts is also negative but insignificant, whereas internet recruitment is associated with a positive but insignificant differential of job satisfaction. If demographic variables are included (Model (2)), the newspaper coefficient becomes insignificant. In the fully specified model, newspaper adverts and employment offices are negatively related to changes in job satisfaction. This finding remains relatively stable in the median regression in Model (4), although the newspaper coefficient is statistically insignificant on the 5%-level.

¹⁹ See Fietze (2011) for an analysis of the relationship between job satisfaction and personality variables based on the SOEP data.

Table 7: Job satisfaction regression

DV: Job Satisfaction	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)	
	OLS Base		OLS Demographics		OLS Full		Fixed Effects		Random Effects	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
<u>Recruitment source (ref. social ties)</u>										
Newspaper (1=yes)	-0.138	(0.083)	-0.153	(0.083)	-0.202*	(0.084)	-0.116	(0.194)	-0.197*	(0.084)
Employment office (1=yes)	-0.388**	(0.123)	-0.377**	(0.123)	-0.273*	(0.125)	-0.785**	(0.297)	-0.294*	(0.126)
Internet (1=yes)	-0.141	(0.117)	-0.184	(0.119)	-0.197	(0.114)	-0.386	(0.273)	-0.219	(0.115)
Gender (1=female)			0.092	(0.071)	0.071	(0.091)				
Years of education			0.022	(0.013)	-0.040*	(0.018)	-0.176	(0.117)	-0.043*	(0.017)
Age			-0.010	(0.029)	-0.015	(0.028)	-0.138	(0.127)	-0.016	(0.028)
Age squared/100			-0.014	(0.037)	0.008	(0.035)	0.318*	(0.002)	0.009	(0.035)
Married (1=yes)			0.222**	(0.084)	0.189*	(0.081)	0.388	(0.302)	0.172*	(0.081)
Children in HH (1=yes)			0.110	(0.097)	0.097	(0.091)	-0.546*	(0.269)	0.074	(0.092)
Immigrant (1=yes)			-0.184	(0.132)	-0.122	(0.118)				
<u>Health (ref.: very good)</u>										
Good (1=yes)					-0.383***	(0.091)	-0.392*	(0.178)	-0.388***	(0.091)
satisfactory (1=yes)					-1.072***	(0.105)	-0.697**	(0.235)	-1.040***	(0.105)
Poor (1=yes)					-1.633***	(0.165)	-1.876***	(0.344)	-1.653***	(0.164)
Bad (1=yes)					-2.194***	(0.485)	-5.443***	(1.016)	-2.284***	(0.495)
Actively sought for new job (1=yes)					-0.031	(0.075)	0.152	(0.153)	-0.014	(0.075)
Unemployed before new job (1=yes)					0.029	(0.086)	0.092	(0.166)	0.024	(0.086)
Total years of unemployment					-0.008	(0.025)	0.033	(0.189)	-0.013	(0.025)
Gross Income (in 1,000 €)					0.086*	(0.041)	0.130	(0.116)	0.091*	(0.038)
Limited contract (1=yes)					0.029	(0.094)	-0.144	(0.197)	0.007	(0.093)
Working hours per week					-0.004	(0.004)	-0.016	(0.009)	-0.006	(0.004)
Public sector (1=yes)					0.331**	(0.113)	0.276	(0.240)	0.305**	(0.113)
<u>Perceived job security (ref.: not concerned at all)</u>										
Very concerned (1=yes)					-1.106***	(0.111)	-1.080***	(0.236)	-1.101***	(0.111)
Somewhat concerned (1=yes)					-0.454***	(0.068)	-0.319*	(0.141)	-0.456***	(0.068)
<u>Branch (ref.: trade)</u>										
Industry (1=yes)					0.248*	(0.104)	0.447	(0.277)	0.223*	(0.105)
Manufacturing (1=yes)					0.427**	(0.153)	0.855*	(0.364)	0.415**	(0.152)
Finance (1=yes)					0.055	(0.114)	0.093	(0.274)	0.047	(0.113)
Services (1=yes)					0.211	(0.115)	0.202	(0.332)	0.227*	(0.114)
<u>Firm size (ref.: less than 20)</u>										
20 to 199 (1=yes)					0.067	(0.080)	0.107	(0.172)	0.076	(0.081)
200 to 1999 (1=yes)					0.182	(0.104)	0.196	(0.225)	0.177	(0.104)
more than 2000 (1=yes)					0.074	(0.109)	-0.040	(0.243)	0.073	(0.108)
<u>ISCO job class. (ref.: legislators, senior officials and managers)</u>										
Professionals (1=yes)					-0.260	(0.159)	0.232	(0.326)	-0.204	(0.157)
Technicians & associate prof. (1=yes)					-0.050	(0.157)	-0.254	(0.304)	-0.013	(0.152)
Clerks (1=yes)					-0.311	(0.185)	-0.221	(0.406)	-0.265	(0.180)
Service workers (1=yes)					-0.062	(0.178)	-0.185	(0.416)	-0.022	(0.173)
Craft and related trade workers (1=yes)					-0.371*	(0.178)	-0.584	(0.468)	-0.362*	(0.177)
Plant and machine operators (1=yes)					-0.228	(0.195)	-0.332	(0.516)	-0.247	(0.192)
Elementary occupations (1=yes)					-0.295	(0.196)	-0.478	(0.482)	-0.287	(0.195)
East Germany (1=yes)					-0.475**	(0.170)				
Regional unemployment rate (in %)					0.041*	(0.018)	-0.031	(0.048)	-0.002	(0.009)
Year dummies		yes		yes		yes		yes		Yes
Constant	7.467***	(0.127)	7.600***	(0.532)	8.849***	(0.621)	11.484***	(2.762)	9.294***	(0.592)
(Adjusted) R ²	overall	0.010		0.021		0.139		0.016		0.136
	within							0.151		0.089
	between							0.011		0.142

Notes: Estimations based on 3,818 observations. Individually clustered standard errors in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively.

Table 8: Change in job satisfaction regressions

DV: Difference in Job Satisfaction	Model (1)		Model (2)		Model (3)		Model (4)	
	OLS Base		OLS Demographics		OLS Full		Median Regression	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
<u>Recruitment source (ref.: social ties)</u>								
Newspaper (1=yes)	-0.040	(0.099)	-0.064	(0.100)	-0.211*	(0.107)	-0.173	(0.110)
Employment office (1=yes)	-0.575***	(0.152)	-0.538***	(0.152)	-0.658***	(0.163)	-0.509**	(0.165)
Internet (1=yes)	0.163	(0.156)	0.141	(0.160)	-0.009	(0.164)	-0.111	(0.151)
Gender (1=female)			-0.082	(0.083)	0.116	(0.110)	0.123	(0.112)
Years of education			0.017	(0.016)	-0.011	(0.021)	-0.003	(0.023)
Age			0.055	(0.034)	0.060	(0.035)	0.014	(0.035)
Age squared/100			-0.001	(0.000)	-0.061	(0.044)	0.004	(0.044)
Married (1=yes)			0.121	(0.100)	0.117	(0.102)	0.025	(0.102)
Children in HH (1=yes)			-0.042	(0.113)	-0.010	(0.115)	-0.132	(0.118)
Immigrant (1=yes)			-0.274*	(0.138)	-0.202	(0.146)	-0.030	(0.154)
<u>Health (ref.: very good)</u>								
Good (1=yes)					0.197	(0.128)	0.114	(0.132)
Satisfactory (1=yes)					-0.024	(0.143)	-0.044	(0.146)
Poor (1=yes)					-0.636**	(0.211)	-0.443*	(0.203)
Bad (1=yes)					-1.290*	(0.519)	-0.571	(0.461)
Actively sought for new job (1=yes)					0.213*	(0.102)	0.169	(0.100)
Unemployed before new job (1=yes)					0.197	(0.116)	0.066	(0.111)
Total years of unemployment					-0.046	(0.039)	-0.035	(0.028)
Gross Income (in 1,000 €)					0.010	(0.053)	0.032	(0.052)
Limited contract (1=yes)					-0.001	(0.125)	0.124	(0.126)
Working hours per week					0.009	(0.005)	0.004	(0.005)
Public sector (1=yes)					0.192	(0.152)	0.077	(0.151)
<u>Perceived job security (ref.: not concerned at all)</u>								
Very concerned (1=yes)					-0.698***	(0.140)	-0.459***	(0.135)
Somewhat concerned (1=yes)					-0.094	(0.095)	-0.098	(0.096)
<u>Branch (ref.: trade)</u>								
Industry (1=yes)					0.107	(0.136)	0.067	(0.137)
Manufacturing (1=yes)					0.350	(0.194)	0.455*	(0.205)
Finance (1=yes)					-0.162	(0.150)	-0.083	(0.145)
Services (1=yes)					0.066	(0.148)	0.061	(0.139)
<u>Firm size (ref.: less than 20)</u>								
20 to 199 (1=yes)					0.117	(0.106)	0.008	(0.108)
200 to 1999 (1=yes)					0.444***	(0.139)	0.574***	(0.136)
more than 2000 (1=yes)					0.167	(0.144)	0.299*	(0.144)
<u>ISCO job class. (ref.: legislators, senior officials and managers)</u>								
Professionals (1=yes)					-0.022	(0.210)	-0.093	(0.234)
Technicians & associate prof (1=yes)					0.189	(0.202)	0.147	(0.222)
Clerks (1=yes)					-0.089	(0.234)	-0.148	(0.244)
Service workers (1=yes)					0.001	(0.230)	-0.053	(0.244)
Craft and related trade workers (1=yes)					-0.073	(0.229)	-0.106	(0.249)
Plant and machine operators (1=yes)					0.214	(0.247)	0.122	(0.264)
Elementary occupations (1=yes)					-0.018	(0.254)	-0.161	(0.266)
East Germany (1=yes)					-0.100	(0.214)	0.137	(0.220)
Regional unemployment rate (in %)					0.004	(0.023)	-0.003	(0.023)
Year dummies		yes		Yes		yes		Yes
Constant	0.923***	(0.175)	-0.391	(0.647)	-0.935	(0.781)	-0.503	(0.760)
(Adjusted) R ²	0.010		0.014		0.042		0.019	

Notes: Estimations based on 3,818 observations. Individually clustered standard errors in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively.

Overall, employees who found their jobs through social ties report higher job satisfaction compared to formal recruitment channels, even if controlling for a variety of demographic and job-related factors. This finding can be interpreted as evidence for the relevance of Realistic Job Previews. These results are discussed more detailed in chapter 5.

Table 9 displays results of two seemingly unrelated regressions. In the first model, logarithmised monthly earnings and the absolute value in job satisfaction are used as the dependent variables. Changes in wage and job satisfaction serve as the dependent variable in in Model (2). Since seemingly unrelated regressions require the same variables in both related regressions, health and perceived job security are also used as control variables in the wage regressions. The findings show that coefficients do not systematically differ from previous regressions above. Furthermore, the residuals of both regressions are weakly correlated (lower than .05) so that the efficiency gains through this approach are small compared to the regressions above (Cameron, Trivedi, 2010).

Table 9: Seemingly unrelated regression results of post-hire outcomes

DV:	Model (1)				Model (2)			
	Ln(Wage)		Job Satisfaction		Δ Wage		Δ Job Satisfaction	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
<u>Recruitment source</u>								
Newspaper (1=yes)	0.017	(0.018)	-0.202*	(0.080)	-0.145	(0.075)	-0.211	(0.113)
Employment office (1=yes)	0.010	(0.028)	-0.279*	(0.119)	-0.011	(0.111)	-0.659***	(0.168)
Internet (1=yes)	0.052*	(0.025)	-0.191	(0.109)	-0.029	(0.102)	-0.009	(0.154)
<u>Gender (1=female)</u>								
Gender (1=female)	-0.152***	(0.018)	0.033	(0.079)	0.293***	(0.074)	0.112	(0.112)
<u>Years of education</u>								
Years of education	0.034***	(0.004)	-0.032*	(0.016)	0.036*	(0.015)	-0.010	(0.023)
<u>Age</u>								
Age	0.045***	(0.006)	-0.009	(0.025)	-0.081***	(0.023)	0.061	(0.035)
<u>Age squared/100</u>								
Age squared/100	-0.047***	(0.007)	0.001	(0.032)	0.094**	(0.030)	-0.062	(0.045)
<u>Married (1=yes)</u>								
Married (1=yes)	-0.003	(0.017)	0.192**	(0.074)	-0.013	(0.069)	0.118	(0.104)
<u>Children in HH (1=yes)</u>								
Children in HH (1=yes)	-0.029	(0.020)	0.101	(0.085)	0.227**	(0.079)	-0.010	(0.120)
<u>Immigrant (1=yes)</u>								
Immigrant (1=yes)	0.007	(0.026)	-0.122	(0.111)	0.171	(0.104)	-0.202	(0.157)
<u>Health (ref.: very good)</u>								
Good (1=yes)	0.017	(0.022)	-0.380***	(0.096)	-0.168	(0.089)	0.198	(0.135)
Satisfactory (1=yes)	-0.044	(0.024)	-1.076***	(0.106)	-0.216*	(0.099)	-0.025	(0.149)
Poor (1=yes)	-0.062	(0.034)	-1.636***	(0.147)	-0.315*	(0.137)	-0.636**	(0.207)
Bad (1=yes)	-0.153*	(0.077)	-2.206***	(0.333)	-0.280	(0.311)	-1.291**	(0.470)
<u>Actively sought for new job (1=yes)</u>								
Actively sought for new job (1=yes)	0.009	(0.017)	-0.034	(0.072)	-0.098	(0.067)	0.212*	(0.102)
<u>Unemployed before new job (1=yes)</u>								
Unemployed before new job (1=yes)	-0.035	(0.018)	0.021	(0.080)	0.165*	(0.075)	0.196	(0.113)
<u>Total years of unemployment</u>								
Total years of unemployment	-0.032***	(0.005)	-0.011	(0.020)	0.059**	(0.019)	-0.046	(0.028)
<u>Limited contract (1=yes)</u>								
Limited contract (1=yes)	-0.064**	(0.021)	0.007	(0.091)	0.090	(0.085)	-0.003	(0.128)
<u>Working hours per week</u>								
Working hours per week	0.034***	(0.001)	0.000	(0.003)	0.010***	(0.003)	0.009*	(0.004)
<u>Public sector (1=yes)</u>								
Public sector (1=yes)	0.055*	(0.025)	0.329**	(0.109)	0.051	(0.102)	0.192	(0.154)
<u>Perceived job security (ref.: not concerned at all)</u>								
Very concerned (1=yes)	-0.052*	(0.023)	-1.112***	(0.098)	-0.014	(0.091)	-0.699***	(0.138)
Somewhat concerned (1=yes)	-0.030	(0.016)	-0.458***	(0.069)	-0.049	(0.065)	-0.094	(0.097)
<u>Branch (reference: trade)</u>								
Industry (1=yes)	0.149***	(0.023)	0.274**	(0.099)	0.125	(0.092)	0.110	(0.139)
Manufacturing (1=yes)	0.171***	(0.034)	0.452**	(0.148)	-0.081	(0.138)	0.353	(0.209)
Finance (1=yes)	0.100***	(0.024)	0.081	(0.104)	-0.077	(0.097)	-0.159	(0.147)
Services (1=yes)	0.081***	(0.023)	0.221*	(0.100)	0.010	(0.094)	0.067	(0.142)
<u>Firm size (ref.: less than 20)</u>								
20 to 199 (1=yes)	0.081***	(0.018)	0.083	(0.078)	-0.043	(0.073)	0.119	(0.110)
200 to 1999 (1=yes)	0.173***	(0.023)	0.215*	(0.098)	0.011	(0.091)	0.448***	(0.138)
more than 2000 (1=yes)	0.139***	(0.024)	0.106	(0.103)	-0.068	(0.096)	0.170	(0.145)
<u>ISCO job class. (ref.: legislators, senior officials, managers)</u>								
Professionals (1=yes)	0.033	(0.039)	-0.267	(0.169)	0.061	(0.158)	-0.023	(0.239)
Technicians and associate prof. (1=yes)	-0.035	(0.037)	-0.087	(0.160)	-0.049	(0.149)	0.185	(0.225)
Clerks (1=yes)	-0.110***	(0.040)	-0.364*	(0.175)	-0.131	(0.163)	-0.095	(0.246)
Service workers (1=yes)	-0.264***	(0.040)	-0.125	(0.174)	0.013	(0.163)	-0.006	(0.246)
Craft and related trade workers (1=yes)	-0.149***	(0.041)	-0.436*	(0.178)	-0.049	(0.166)	-0.080	(0.251)
Plant and machine operators (1=yes)	-0.297***	(0.043)	-0.309	(0.188)	-0.011	(0.176)	0.205	(0.265)
Elementary occupations (1=yes)	-0.379***	(0.044)	-0.371*	(0.189)	-0.007	(0.177)	-0.027	(0.267)
<u>East Germany (1=yes)</u>								
East Germany (1=yes)	-0.063	(0.037)	-0.496**	(0.159)	-0.060	(0.149)	-0.102	(0.224)
<u>Regional unemployment rate (in %)</u>								
Regional unemployment rate (in %)	-0.019***	(0.004)	0.038*	(0.017)	-0.001	(0.016)	0.003	(0.024)
<u>Year dummies</u>								
	yes		yes		yes		Yes	
Constant	5.167***	(0.131)	8.736***	(0.567)	1.114*	(0.530)	-0.948	(0.800)
<u>Correlation residuals</u>								
	0.049				0.027			
R ²	0.669		0.137		0.032		0.042	

Notes: Estimations based on 3,818 observations. Standard errors in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively.

4.2.3 Turnover

The first descriptive results prefigured that job search through the internet might be related to higher turnover rates, whereas newspaper adverts appear to be linked to lower turnover rates. However, it was not clear if this finding could be a result of demographic differences such as age and education. Therefore, cross-sectional regressions are performed to control for potential correlations between these variables. Table 10 contains multivariate results on the determinants of turnover. The dependent variable indicates whether the individual has changed the previously found job after the given period of time. Therefore, over time, the number of job changers increases because it is only of interest if the individual left the initially found job at time t , not if other jobs found later ($t+x$) were changed or not.

With respect to recruitment channels, the results show that no difference in turnover is found between social ties and employment agencies. The newspaper coefficient, though statistically insignificant on the 5%-level, is negative between two to five years after the job change. Finding a job on the internet is linked to a higher turnover probability which is significant four and five years after the change. Table 11 comprises marginal effects of the logarithmic regressions. The results show that finding a job via internet increases turnover probability after four (respectively five) years by 8 (10) percentage points. For comparison, 1,000 euros higher monthly income decreases turnover probability by 4 percentage points. Thus, the higher probability of turnover for those who found their job via internet adverts appears economically relevant.

Table 10: Turnover regressions

DV: Job change (1=yes)	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)	
	After 1 year		After 2 years		After 3 years		After 4 years		After 5 years	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
<u>Recruitment source (ref.: social ties)</u>										
Newspaper (1=yes)	0.020	(0.091)	-0.132	(0.094)	-0.120	(0.099)	-0.157	(0.105)	-0.168	(0.113)
Employment office (1=yes)	-0.074	(0.132)	-0.061	(0.141)	0.008	(0.145)	-0.132	(0.157)	-0.095	(0.174)
Internet (1=yes)	0.118	(0.126)	0.264	(0.136)	0.285	(0.147)	0.338*	(0.160)	0.405*	(0.186)
Gender (1=female)	-0.175	(0.094)	-0.146	(0.098)	-0.062	(0.104)	0.025	(0.111)	-0.090	(0.122)
Years of education	-0.014	(0.019)	-0.024	(0.019)	-0.011	(0.020)	-0.017	(0.022)	0.000	(0.024)
Age	0.006	(0.028)	-0.006	(0.030)	-0.024	(0.032)	-0.030	(0.035)	-0.019	(0.039)
Age squared/100	-0.007	(0.036)	0.014	(0.039)	0.027	(0.042)	0.034	(0.045)	0.016	(0.049)
Married (1=yes)	-0.178*	(0.084)	-0.188*	(0.087)	-0.113	(0.092)	-0.066	(0.098)	-0.039	(0.107)
Children in HH (1=yes)	-0.121	(0.100)	-0.212*	(0.105)	-0.149	(0.117)	-0.293*	(0.136)	-0.239	(0.169)
Immigrant (1=yes)	0.049	(0.126)	0.139	(0.137)	0.045	(0.144)	0.056	(0.159)	0.130	(0.175)
<u>Health (ref.: very good)</u>										
Good (1=yes)	-0.227*	(0.109)	-0.224*	(0.113)	-0.253*	(0.118)	-0.253*	(0.128)	-0.211	(0.141)
Satisfactory (1=yes)	-0.302*	(0.123)	-0.173	(0.127)	-0.121	(0.133)	-0.089	(0.144)	-0.103	(0.158)
Poor (1=yes)	-0.149	(0.173)	0.066	(0.179)	-0.118	(0.189)	-0.065	(0.204)	0.017	(0.221)
Bad (1=yes)	-0.585	(0.406)	-0.833*	(0.405)	-0.560	(0.429)	-0.939	(0.518)	-0.697	(0.579)
Actively sought for new job (1=yes)	0.069	(0.084)	0.088	(0.085)	0.028	(0.090)	0.059	(0.097)	0.119	(0.107)
Unemployed before new job (1=yes)	0.101	(0.091)	0.232*	(0.095)	0.191	(0.100)	0.225*	(0.109)	0.251*	(0.118)
Total years of unemployment	0.023	(0.020)	0.034	(0.023)	0.029	(0.028)	0.022	(0.031)	0.014	(0.034)
Gross Income (in 1,000 €)	-0.127*	(0.051)	-0.149**	(0.005)	-0.147**	(0.050)	-0.161**	(0.054)	-0.158**	(0.057)
Limited contract (1=yes)	0.389***	(0.107)	0.326**	(0.117)	0.245	(0.133)	0.368*	(0.164)	0.283	(0.213)
Working hours per week	0.004	(0.004)	0.004	(0.004)	0.005	(0.004)	0.004	(0.004)	0.004	(0.005)
Public sector (1=yes)	-0.344**	(0.126)	-0.414**	(0.133)	-0.389**	(0.141)	-0.329*	(0.154)	-0.359*	(0.168)
<u>Perceived job security (ref.: not concerned at all)</u>										
Very concerned (1=yes)	0.421***	(0.111)	0.388***	(0.115)	0.369**	(0.124)	0.236	(0.132)	0.140	(0.146)
Somewhat concerned (1=yes)	0.186*	(0.084)	0.191*	(0.084)	0.173*	(0.088)	0.077	(0.094)	0.079	(0.101)
<u>Branch (ref.: trade)</u>										
Industry (1=yes)	-0.077	(0.112)	-0.148	(0.113)	-0.247*	(0.118)	-0.342**	(0.127)	-0.453***	(0.137)
Manufacturing (1=yes)	0.027	(0.166)	0.054	(0.162)	0.002	(0.178)	0.042	(0.196)	-0.076	(0.217)
Finance (1=yes)	0.112	(0.116)	0.036	(0.119)	0.094	(0.127)	0.080	(0.138)	0.036	(0.151)
Services (1=yes)	-0.082	(0.116)	-0.113	(0.120)	-0.059	(0.128)	-0.147	(0.137)	-0.183	(0.147)
<u>Firm size (ref.: less than 20)</u>										
20 to 199 (1=yes)	-0.169	(0.089)	-0.183*	(0.091)	-0.195*	(0.097)	-0.182	(0.104)	-0.189	(0.114)
200 to 1999 (1=yes)	-0.114	(0.114)	-0.193	(0.116)	-0.163	(0.122)	-0.129	(0.133)	-0.238	(0.146)
more than 2000 (1=yes)	-0.214	(0.121)	-0.465***	(0.121)	-0.437***	(0.127)	-0.416**	(0.139)	-0.549***	(0.150)
<u>ISCO job class. (ref.: legislators, senior officials and managers)</u>										
Professionals (1=yes)	0.164	(0.209)	0.107	(0.199)	0.215	(0.215)	0.251	(0.231)	0.202	(0.248)
Technicians & associate prof. (1=yes)	0.024	(0.196)	-0.131	(0.190)	-0.098	(0.206)	-0.182	(0.224)	-0.193	(0.237)
Clerks (1=yes)	0.163	(0.213)	0.063	(0.209)	-0.096	(0.225)	-0.361	(0.244)	-0.555*	(0.261)
Service workers (1=yes)	0.029	(0.219)	-0.229	(0.211)	-0.240	(0.227)	-0.402	(0.246)	-0.442	(0.260)
Craft and related trade workers (1=yes)	0.044	(0.221)	0.072	(0.211)	0.160	(0.227)	0.139	(0.248)	0.18566	(0.265)
Plant and machine operators (1=yes)	-0.071	(0.232)	-0.237	(0.226)	-0.095	(0.248)	-0.085	(0.267)	-0.096	(0.282)
Elementary occupations (1=yes)	-0.040	(0.234)	-0.448*	(0.229)	-0.467	(0.246)	-0.698**	(0.267)	-0.646*	(0.284)
East Germany (1=yes)	-0.430*	(0.183)	-0.520**	(0.199)	-0.530*	(0.215)	-0.846***	(0.240)	-0.905***	(0.271)
Regional unemployment rate (in %)	0.030	(0.019)	0.046*	(0.020)	0.042	(0.022)	0.066**	(0.023)	0.067**	(0.026)
Year dummies	yes		yes		yes		yes		yes	
Constant	-0.364	(0.658)	0.629	(0.690)	0.947	(0.732)	1.265	(0.781)	1.132	(0.850)
Observations	3,549		3,210		2,852		2,501		2,159	
McFadden Pseudo-R ²	0.029		0.047		0.042		0.049		0.051	

Notes: Individually clustered standard errors in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively.

Table 11: Marginal effects of turnover

DV: Turnover	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)	
	After 1 year		After 2 years		After 3 years		After 4 years		After 5 years	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
<u>Recruitment source (ref.: social ties)</u>										
Newspaper (1=yes)	0.004	(0.020)	-0.033	(0.023)	-0.030	(0.025)	-0.039	(0.026)	-0.042	(0.028)
Employment office (1=yes)	-0.016	(0.028)	-0.015	(0.035)	0.002	(0.036)	-0.033	(0.039)	-0.024	(0.043)
Internet (1=yes)	0.026	(0.029)	0.066*	(0.034)	0.071*	(0.036)	0.083*	(0.038)	0.097*	(0.043)
Gender (1=female)	-0.039	(0.021)	-0.036	(0.025)	-0.016	(0.026)	0.006	(0.028)	-0.022	(0.030)
Years of education	-0.003	(0.004)	-0.006	(0.005)	-0.003	(0.005)	-0.004	(0.006)	0.000	(0.006)
Age	0.001	(0.006)	-0.002	(0.008)	-0.006	(0.008)	-0.008	(0.009)	-0.005	(0.010)
Age squared/100	-0.002	(0.008)	0.004	(0.010)	0.007	(0.010)	0.008	(0.011)	0.004	(0.012)
Married (1=yes)	-0.040*	(0.019)	-0.047*	(0.022)	-0.028	(0.023)	-0.016	(0.024)	-0.010	(0.027)
Children in HH (1=yes)	-0.027	(0.022)	-0.053*	(0.026)	-0.037	(0.029)	-0.073*	(0.034)	-0.059	(0.042)
Immigrant (1=yes)	0.011	(0.028)	0.035	(0.034)	0.011	(0.036)	0.014	(0.040)	0.032	(0.043)
<u>Health (ref.: very good)</u>										
Good (1=yes)	-0.052*	(0.025)	-0.056*	(0.028)	-0.063*	(0.029)	-0.063*	(0.032)	-0.052	(0.034)
Satisfactory (1=yes)	-0.068*	(0.028)	-0.043	(0.032)	-0.030	(0.033)	-0.022	(0.036)	-0.025	(0.039)
Poor (1=yes)	-0.034	(0.040)	0.016	(0.045)	-0.030	(0.047)	-0.016	(0.051)	0.004	(0.054)
Bad (1=yes)	-0.125	(0.078)	-0.199*	(0.088)	-0.138	(0.103)	-0.228*	(0.115)	-0.172	(0.140)
Actively sought for new job (1=yes)	0.015	(0.019)	0.022	(0.021)	0.007	(0.023)	0.015	(0.024)	0.029	(0.027)
Unemployed before new job (1=yes)	0.022	(0.020)	0.058*	(0.024)	0.048	(0.025)	0.056*	(0.027)	0.062*	(0.029)
Total years of unemployment	0.005	(0.005)	0.008	(0.006)	0.007	(0.007)	0.005	(0.008)	0.003	(0.008)
Gross Income (in 1,000 €)	-0.028*	(0.011)	-0.037**	(0.012)	-0.037**	(0.013)	-0.040**	(0.013)	-0.039**	(0.014)
Limited contract (1=yes)	0.086***	(0.024)	0.081**	(0.029)	0.061	(0.033)	0.092*	(0.041)	0.070	(0.053)
Working hours per week	0.001	(0.001)	0.001	(0.001)	0.001	(0.001)	0.001	(0.001)	0.001	(0.001)
Public sector (1=yes)	-0.076**	(0.028)	-0.103**	(0.033)	-0.097**	(0.035)	-0.082**	(0.038)	-0.089*	(0.042)
<u>Perceived job security (ref.: not concerned at all)</u>										
Very concerned (1=yes)	0.095***	(0.025)	0.097***	(0.029)	0.092**	(0.031)	0.059	(0.033)	0.035	(0.036)
Somewhat concerned (1=yes)	0.040*	(0.018)	0.047*	(0.021)	0.043*	(0.022)	0.019	(0.024)	0.020	(0.025)
<u>Branch (ref.: trade)</u>										
Industry (1=yes)	-0.017	(0.025)	-0.037	(0.028)	-0.061*	(0.029)	-0.085**	(0.032)	-0.112***	(0.034)
Manufacturing (1=yes)	0.006	(0.037)	0.013	(0.041)	0.000	(0.044)	0.010	(0.048)	-0.019	(0.053)
Finance (1=yes)	0.025	(0.026)	0.009	(0.030)	0.023	(0.032)	0.020	(0.034)	0.009	(0.037)
Services (1=yes)	-0.018	(0.025)	-0.028	(0.030)	-0.015	(0.032)	-0.037	(0.034)	-0.045	(0.036)
<u>Firm size (ref.: less than 20)</u>										
20 to 199 (1=yes)	-0.038	(0.020)	-0.046*	(0.023)	-0.049*	(0.024)	-0.045	(0.026)	-0.047	(0.028)
200 to 1999 (1=yes)	-0.026	(0.025)	-0.048	(0.029)	-0.041	(0.030)	-0.032	(0.033)	-0.059	(0.036)
more than 2000 (1=yes)	-0.047	(0.026)	-0.115***	(0.029)	-0.108***	(0.031)	-0.104**	(0.034)	-0.136***	(0.037)
<u>ISCO job class. (ref.: legislators, senior officials and managers)</u>										
Professionals (1=yes)	0.037	(0.046)	0.027	(0.050)	0.053	(0.053)	0.061	(0.056)	0.048	(0.059)
Technicians & associate prof. (1=yes)	0.005	(0.043)	-0.033	(0.047)	-0.024	(0.051)	-0.045	(0.055)	-0.047	(0.058)
Clerks (1=yes)	0.037	(0.047)	0.016	(0.052)	-0.024	(0.056)	-0.090	(0.060)	-0.138*	(0.063)
Service workers (1=yes)	0.006	(0.048)	-0.057	(0.053)	-0.060	(0.057)	-0.100	(0.061)	-0.109	(0.063)
Craft and related trade workers (1=yes)	0.010	(0.048)	0.018	(0.053)	0.040	(0.057)	0.034	(0.061)	0.044	(0.063)
Plant and machine operators (1=yes)	-0.015	(0.050)	-0.059	(0.056)	-0.024	(0.062)	-0.021	(0.066)	-0.023	(0.069)
Elementary occupations (1=yes)	-0.009	(0.051)	-0.110*	(0.056)	-0.115	(0.060)	-0.172**	(0.065)	-0.160*	(0.069)
East Germany (1=yes)	-0.095*	(0.040)	-0.130**	(0.050)	-0.133*	(0.054)	-0.211***	(0.060)	-0.224***	(0.067)
Regional unemployment rate (in %)	0.007	(0.004)	0.0114*	(0.005)	0.010	(0.005)	0.016**	(0.006)	0.017**	(0.006)
Year dummies	yes		yes		yes		yes		yes	
Observations	3,549		3,210		2,852		2,501		2,159	

Notes: Individually clustered standard errors in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively.

4.3 Results from Sup-group Analyses

The population of job seekers is much more heterogeneous than assumed until now. As the large number of control variables indicates, certain demographic or job characteristics are able to explain differences in wages and job satisfaction to a large amount. However, the analyses above do not implement possible interaction effects for reasons of simplicity. Therefore, additional sensitivity analyses are conducted to allow for different source effects for employee subgroups. Although not shown in detail, all regressions contain the same set of control variables as the calculations above. Subgroup results on turnover are not provided since too many observations are lost in each year in the turnover regressions.

4.3.1 Gender Differences

As already shown in chapter 4.1, gender differences in source usage are prevalent as females are more likely to find a new job via newspaper adverts. Females might dispose of less valuable social ties than men due to traditional family roles or gender based segregation of the labour market (Mortensen, Vishwanath, 1994; McPherson et al., 2001). Table 12 shows regression results of the effectiveness measures separated by gender. In both wage regressions, source coefficients are similar to the regressions above, though, statistically insignificant. Furthermore, regression results unveil that job seekers of both genders report lower satisfaction if they found their jobs via formal means. However, the effect is solely significant for females who were successful via newspaper adverts. Regarding the satisfaction differential, both males and females report significantly lower levels of job satisfaction when they found their job with the aid of employment offices. For females, the newspaper coefficient is negative and significant. Thus, one can conclude that gender differences partially account for the negative effect of newspaper adverts on job satisfaction. With respect to wages, neither females nor males benefit from finding a job via informal means.

Table 12: Regression results of recruitment channel effectiveness, separated by gender

Dependent variable	Log(Wage)		Δ Wage (in %)		Job Satisfaction		Δ Job Satisfaction	
	Male	Female	Male	Female	Male	Female	Male	Female
Newspaper (1=yes)	0.043 (0.024)	0.014 (0.028)	-0.082 (0.065)	-0.184 (0.096)	-0.119 (0.122)	-0.295* (0.118)	-0.116 (0.159)	-0.306* (0.151)
Employment office (1=yes)	0.017 (0.033)	0.025 (0.043)	0.093 (0.172)	-0.182 (0.177)	-0.304 (0.175)	-0.313 (0.179)	-0.690** (0.230)	-0.705** (0.239)
Internet (1=yes)	0.057 (0.036)	0.061 (0.036)	-0.043 (0.113)	-0.011 (0.146)	-0.190 (0.163)	-0.210 (0.158)	0.232 (0.231)	-0.295 (0.232)
Observations	1,889	1,929	1,889	1,929	1,889	1,929	1,889	1,929
R ²	0.502	0.692	0.034	0.042	0.179	0.130	0.062	0.050

Notes: Robust standard errors in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively. Also controlled for demographic and job-specific characteristics.

4.3.2 Regional Differences

The German division after the Second World War and more than 40 years of Communist regime still has a considerable long-term impact on living conditions, ethical values, and behaviour in East Germany. Until now, employees in East Germany earn less than their colleagues in West Germany (Gernandt, Pfeiffer, 2008; Brück, Peters, 2009). Furthermore, Vatter (2012) found support for an east-west disparity in terms of subjective well-being. Additionally, recruitment channel usage differs between East and West Germany. East Germans find their jobs more frequently via personal contacts or public employment offices than West Germans. West Germans rely more heavily on newspaper adverts.²⁰ Thus, it can be assumed that recruitment sources differ in their efficiency due to regional disparities.

Table 13 depicts regression results separated for West and East Germany. Wages of West German employees do not differ with regard to the source they found their jobs through. However, East Germans who were successful via internet search gain a wage premium of 15 percent. This finding is not supported when the relative wage differential acts as the dependent variable. Similar to the regressions for the whole sample, in West Germany newspaper adverts are associated to a lower wage increase of 14 percent. This lower wage increase is comparable in size in East Germany but insignificant. Regarding the effects on job satisfaction, West German employees report significantly lower job satisfaction when they found their jobs via one of the formal means. In East Germany, this negative effect is considerably smaller and insignificant. With respect to changes in job satisfaction, both East and West German employees report a significantly lower change in job satisfaction compared to the reference group when the job was found via employment agencies.

Table 13: Regression results of recruitment channel effectiveness, separated by region

Dependent Variable	Log(Wage)		Δ Wage (in %)		Job Satisfaction		Δ Job Satisfaction	
	West	East	West	East	West	East	West	East
Newspaper (1=yes)	0.016 (0.022)	0.012 (0.040)	-0.142* (0.062)	-0.118 (0.159)	-0.228* (0.095)	-0.118 (0.191)	-0.208 (0.122)	-0.124 (0.250)
Employment office (1=yes)	-0.006 (0.033)	0.077 (0.043)	0.032 (0.115)	-0.174 (0.351)	-0.382** (0.146)	-0.058 (0.243)	-0.648*** (0.186)	-0.693* (0.347)
Internet (1=yes)	0.025 (0.031)	0.148*** (0.044)	-0.021 (0.121)	-0.048 (0.141)	-0.312* (0.132)	0.124 (0.243)	0.000 (0.196)	-0.008 (0.312)
Observations	2,965	853	2,965	853	2,965	853	2,965	853
R ²	0.692	0.581	0.029	0.088	0.143	0.161	0.042	0.088

Notes: Robust standard errors in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively. Also controlled for demographic and job-specific characteristics.

²⁰ These results are widely confirmed by a study of the German Institute for Employment Research, IAB (2011).

Two arguments are able to explain the efficiency differential of internet adverts in East and West Germany. First, the dissemination of high speed internet has unfolded less rapidly in East than in West Germany (TÜV Rheinland, 2015). Thus, internet recruitment is more likely in urban metropolitan areas than in rural regions. Furthermore, high speed internet might first be disseminated to more developed regions where people are higher educated. Thus, a different population of job seekers is attracted by internet adverts. The second argument stresses the supra-regional view of internet job search. In contrast to newspaper adverts who address local or regional labour markets, internet adverts are more likely to reach people nationwide. As a consequence, job offers reflect a tendency of harmonisation of wages, which means that firms pay higher wages than usual in East Germany and employees report higher job satisfaction. Overall, there is only weak evidence for differences in efficiency – except internet advertising – between East and West German job seekers.

4.3.3 Differences in Education

Regression results in chapter 4.2.1 indicate that the employees' level of education is an important factor for the determination of wages (positive) and job satisfaction (negative).²¹ However, efficiency of job channels could differ between levels of education. For example, highly educated job seekers could dispose of more personal contacts that are useful in finding a job than job seekers with solely elementary education. Therefore, an analysis of two distinct labour market groups – high-skilled and low-skilled – appears to be worthwhile.

Table 14: Regression results of recruitment channel effectiveness, separated by level of education

Dependent Variable	Log(Wage)		Δ Wage (in %)		Job Satisfaction		Δ Job Satisfaction	
	High	Low	High	Low	High	Low	High	Low
Newspaper (1=yes)	-0.019 (0.041)	-0.086 (0.065)	-0.213 (0.185)	-0.320 (0.234)	-0.427* (0.179)	-0.274 (0.257)	-0.274 (0.239)	-0.234 (0.343)
Employment office (1=yes)	-0.031 (0.070)	-0.079 (0.070)	-0.171 (0.544)	-0.092 (0.390)	0.061 (0.310)	-0.306 (0.361)	-0.047 (0.521)	-0.553 (0.483)
Internet (1=yes)	-0.030 (0.041)	0.012 (0.104)	-0.100 (0.219)	-0.780* (0.344)	-0.224 (0.179)	0.247 (0.675)	-0.253 (0.276)	1.250 (1.034)
Observations	752	383	752	383	752	383	752	383
R ²	0.647	0.725	0.063	0.133	0.231	0.218	0.087	0.153

Notes: Robust standard errors in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively. Also controlled for demographic and job-specific characteristics.

Regression results for more and less²² educated employees are shown in Table 14. For highly educated job seekers there seems to be no correlation between source usage and wages. However, highly educated employees who found their jobs via newspaper adverts report

²¹ See e.g. Gordon and Arvey (1975) or Arvey et al. (1991) for empirical evidence on this relation.

²² The category 'low education' comprises both inadequate (1) and elementary education (2) according the International Standard Classification of Education (ISCED-97) framework (UNESCO, 2006).

lower levels of job satisfaction. For less educated job searchers, a considerably smaller wage increase is estimated when the job was found via internet adverts. No differences have been detected regarding job satisfaction.

4.3.4 Difference in Origin

Surprisingly, regression results in chapter 4.2.1 do not reveal any wage differences between natives and immigrants in the fully specified model with branch and job controls. However, this does not necessarily contradict empirical results which detect an immigrant-native wage gap in Germany.²³ Differences in the source usage of immigrants and natives could explain wage differences. On the one hand, immigrants could rely more on social ties, especially in case of language deficits or when employers cannot access the quality of education received in their former country of residence. On the other hand, immigrant might lack social ties that could be helpful in the labour market (Behtoui, 2008; Behtoui, Neergaard, 2010).

Table 15 contains separate regression results for natives and immigrants. Only natives who found their job on the internet report a wage increase of 6 percent, however, wage increases after finding a job via newspaper adverts are lower for them. Furthermore, natives are affected by significantly lower job satisfaction by the use of formal means, for immigrants the job satisfaction coefficients are negative but insignificant. Regarding satisfaction differentials, natives and immigrants report smaller changes when the job was found with the aid of employment agencies. Additionally, immigrants report a lower increase in job satisfaction if the job was found via newspaper adverts. To summarise, differences between natives and immigrants are rather small, only the negative relationship between finding a job via formal channels and job satisfaction appears to be more robust concerning natives.

Table 15: Regression results of recruitment channel effectiveness, separated by origin

Dependent Variable	Log(Wage)		Δ Wage		Job Satisfaction		Δ Job Satisfaction	
	Native	Immigrant	Native	Immigrant	Native	Immigrant	Native	Immigrant
Newspaper (1=yes)	-0.059	0.028	-0.449	-0.111*	-0.326	-0.184*	-0.791*	-0.171
	0.078	0.020	0.426	0.056	0.295	0.088	0.373	0.112
Employment office (1=yes)	0.071	0.009	0.124	-0.029	-0.484	-0.262*	-1.232*	-0.595***
	0.078	0.029	0.502	0.130	0.394	0.132	0.510	0.173
Internet (1=yes)	-0.003	0.057*	-0.793	0.017	-0.032	-0.200	0.166	-0.008
	0.091	0.027	0.924	0.086	0.467	0.118	0.731	0.168
Observations	339	3,479	339	3,479	339	3,479	339	3,479
R ²	0.757	0.661	0.113	0.039	0.296	0.137	0.203	0.045

Notes: Robust standard errors in parentheses. *, **, and *** denote levels of significance at 5, 1, or 0.1 percent, respectively. Also controlled for demographic and job-specific characteristics.

²³ See e.g. Bartolucci (2010) or Aldashev et al. (2012) for an empirical analysis of the immigrants' wage gap.

5 Discussion

As shown in the previous chapter, the efficiency of recruitment channels is a complex question and effects differ substantially across subgroups. Thus, the results have to be interpreted carefully. In general, personal contacts do not result in higher wages; in fact, those who were successful via internet adverts earn even higher wages. Regarding non-monetary outcomes, though, the results indicate that job search via social ties is associated with higher job satisfaction. Furthermore, weak evidence has been provided for a positive correlation between informal channels and turnover. In this chapter, these mixed findings are interpreted and potential shortcomings of this study are given. First, arguments are given why wages are not or negatively related to finding a job via social ties. Second, the – at least partial – positive relationship between social ties and non-monetary outcomes is discussed. Special emphasis is laid upon the two alternative hypotheses described in chapter 2. Third, limitations of this study are described. Finally, practical implications of the findings are elaborated.

5.1 Explanation of the Empirical Findings

With respect to wages, Individual Differences seem to be able to explain most of the variation in the dependent variable. According to Table 5, income differences between sources of information can be explained by individual demographic and job-related characteristics. Only those who found a job via internet adverts earn higher wages.

Two further arguments could explain the absence of wage effects of recruitment sources. One reason might be high rigidity of the German labour market (Kemmerling, Bruttel, 2006). Employers and employees bargain collective wage agreements on branch level and additional agreements are reached on company or plant level. As a result, high wage dispersion in a single firm for comparable jobs is quite unlikely in Germany. Therefore, employers are not able to pay higher wages for those who were hired through a particular recruitment channel. Such wage dispersion is more likely to occur in case of high potentials, for which no collectively bargained wages exist. However, empirical evidence in this study does not support this argument in case of highly educated employees. In line with this argument, Brenzel et al. (2014) found that 62 percent of the job offers in Germany can be characterised as wage-postings, meaning that there is a simple take-it-or-leave-it decision regarding these kind of job offers. Wage-postings can be found frequently in the public sector, in larger firms and in firms that are covered by collective wage agreements. On the contrary, 38 percent of the job offers can be described as wage-bargaining situations in which job seekers negotiate

their future wage. According to the authors, this phenomenon mainly can be found for higher educated job searchers or in tight regional labour markets.

Another explanation for the convergence of wages between search channels is based on the behavioural model of rational choice (Simon, 1955). Bounded rationality disables total information procurement of all job offers in the market. Furthermore, job seekers do not obtain all offers at the same point in time but sequentially. In a simplified search model, in which all job offers only differ as to wages, job searchers only know about the distribution of all job offers. However, they cannot foresee the sequence of job offers they receive in future periods. Consequently, applicants set an ex-ante aspiration level, a wage which evokes indifference between accepting and rejecting the job offer. One could assume that this aspired wage is first of all determined by market wages, demographic factors, and personality traits and not by the channels applicants use when searching for a new job. Hence, employees' wages do not differ as a function of the respective recruiting channel used. This implies that job seekers do not receive better or more information on vacancies that lead to more or better draws from the wage distribution.

The quality of information – which tends to be more precise in case of referrals (Simons et al., 1970) – does not result in higher starting wages. With regard to non-monetary benefits of social capital, realistic expectations (Rees, 1966; Wanous, 1978) seem to affect job satisfaction positively. Personal contacts to insiders provide outside job applicants with valuable information on internal structures and working conditions that are not disclosed to other job seekers. As working conditions are crucial for the satisfaction of employees, the disclosure of trustworthy job-related information makes it more likely for job seekers to apply to the job. For those employees, faceless firms become transparent and get a distinct image. Thus, from the perspective of post-hire outcomes, referrals are a promising means in order to select motivated employees that match both job and company requirements. Another explanation for the observed increase in job satisfaction could be pre-screening of the person that recommends the job seeker. With the underlying data no distinction of these two different effects can be made. However, for the interpretation of the results, it is not necessary to know if referrers are responsible for a positive selection of employees or if employees select themselves due to a wider base of information. The results indicate a meaningful positive effect on job satisfaction which must be interpreted as a source effect as it is controlled for many demographic and job-related aspects.

Changes in job satisfaction after a job change are commonly described by a honeymoon-hangover relationship (Boswell et al., 2005), which implies that job seekers commonly report an increase in job satisfaction after a change which decreases over time. However, individuals who found a job via social ties still report a higher job satisfaction, although they disposed of more realistic ex-ante information about a certain job. Satisfaction measures could also be biased due to the reasons for the job change, i.e. voluntary or involuntary quit. Especially voluntary job changes could be associated with higher job satisfaction, while involuntary quits could be related to lower job satisfaction because jobs are accepted to escape or to avoid unemployment. Although variables on the reasons of job changes are not included because of too many missing values, other variables like off-the-job search (being unemployed before the job change) and the active search dummy should cover at least part of this aspect.

Interestingly, the positive satisfaction effect does not result in a lower turnover ratio of those recruited after referrals. This can be interpreted as a short-term effect on satisfaction, as (dis-)satisfaction is most likely to be a core determinant of turnover. In the long-run, better pre-hire information are not able to reduce the turnover probability significantly. Practical implications of this finding are discussed in chapter 5.3.

5.2 Limitations

Six major problems of the data limit the analysis and henceforth the degree of detail of the results. First, job search is only investigated from a retrospective view. Unfortunately the data does not contain information on all channels job searchers used during their job search process but only on the source employees actually found their current job through. However, job seekers generally exploit a broad variety of search channels and do not only concentrate on the most promising channel. Thus, it is not possible to distinguish between job seekers that invested much time into job search via multiple channels and those who once talked to a peer and then switched jobs. Outcomes are likely to depend on the scope of recruitment channel usage which remains unexplored in this study.

The second and maybe more serious shortcoming is that the data does not distinguish between different kinds of referrals. According to Granovetter's strength-of-weak-ties argument, acquaintances are more helpful in the job search process than close friends or relatives as there are less information redundancies among weakly tied individuals. Individuals with a large network of weak ties dispose of more valuable information and thus are likely to find better paid jobs. Referrals by close friends or relatives might be less useful in terms of monetary outcomes as the probability to find a highly paid job is lower.

An empirical investigation by Antoninis (2006) supports this theoretical argument. For workers of a manufacturing firm the author detected higher starting wages for those who were recommended by someone who is able to assess their productivity. In contrast to this, referrals by close friends or relatives did not increase starting wages. This finding is surprising since productivity might be more easily assessed in manufacturing jobs in comparison to jobs in other branches (service, finance). For employees who work in jobs that require a broad set of cognitive abilities which cannot be directly observed, social ties might be even more helpful. Referrers might be able to reduce information asymmetries due to their knowledge about matching quality especially in jobs where information asymmetries are severe.

Likewise, from the employee's perspective, the quality of information also depends on the position of the referrer. Applicants regard information by potential co-workers concerning job characteristics or organizational routines as more trustworthy compared to supervisors or members of the HR department. Employees who work at the same hierarchy level and have similar tasks are able to evaluate job characteristics from their own experience. Supervisors or HR managers have less insight into working routines. Furthermore, they might be forced to find new employees very quickly to minimize vacancy costs. In their survey on the credibility of sources of information, Fisher et al. (1979) found that business school seniors trust incumbents and friends more than interviewers. Participants were less likely to accept the job if their source of information was a corporate interviewer. Therefore, one can expect larger increases post-hire outcomes for those referred by employees of the same hierarchy level.

Apart from the role of the particular person that recommends the job seeker, another interesting aspect is mentioned by Caliendo et al. (2011). The authors analysed how the overall network size affects search behaviour and found evidence that network size, measured as the number of close friends outside the family, was positively correlated with the likelihood of informal search channel usage. Furthermore, an increase in applicants' network size was perceived as an increase in search productivity and therefore led to higher reservation wages of around 1 percent. Thus, the authors assumed that higher reservation wages should result in higher wages. On the contrary, one could predict that the perception of a highly valuable network makes job seekers overconfident. Higher reservation wages could cause longer search periods associated to costs of search and forgone earnings. Therefore, it is unclear whether the confidence effect compensates the increase in reservation wages. As a result, a detailed analysis of the role of the referrer should implement measures of reservation wages and overall network size.

Another problem occurs as it is not absolutely possible to assess increases in wages or job satisfaction due to a job change. First, it is not possible to observe the counter-factual wage an employee would have earned if he had stayed in the company. It is possible that employees were close to promotion in their former job and then did not accomplish this wage increase due to their job change. As a consequence, wage increases could be overestimated. However, this seems to be a minor problem as employees are likely to anticipate promotions (e.g. due to comments of supervisors) and are not willing to leave the job then. Additionally, changes in wages and job satisfaction are not only determined by factors measured after the job change (t), but also by wage determinants in t-1. Especially changes in determinants, e.g. branch or occupation, are likely to explain post-hire outcome differentials. Due to lack of available data (the number of observations would have shrunk considerably), lagged variables of post-hire determinants have not been included in the regressions. Furthermore, doubling the number of variables does not seem to be helpful in order to gain robust estimates.

Fourth, a considerably more serious problem pertains to the points of time the data is collected. Employees participate in the survey once when they are close to leave the company and again when they just have changed the job. Hence, they maybe worked several years for their past employer but only some months in their new jobs which is likely to affect wage and job satisfaction differentials. If firms pay seniority wages, which increase with tenure, individuals are likely to receive lower wages in their new occupation. In this case job changers anticipate future wage increases which are not contained in the data. However, it is assumed that such wage effects are equally distributed among job changers independent from the source of information. The reversed problem accrues in terms of job satisfaction. Employees often change their job when they are dissatisfied with working conditions, supervisors, or co-workers. Job satisfaction is likely to decrease over time as one gets to know more and more negative aspects of the current employers. Hence, changing to a new employer necessarily increases job satisfaction as kind of “gift of ignorance” or honeymoon effect (Boswell et al., 2005). Once again, there are no indicators that this effect differs between recruitment channels, but job satisfaction increases after job changes have to be interpreted carefully. This problem cannot be solved calculating the job satisfaction differential after a certain period of acclimatisation (e.g. after two or three years). Job satisfaction is likely to be correlated to turnover as dissatisfied employees are expected quit the current job. However, referrals affect job satisfaction positively by a better quality of ex-ante information. Therefore, employees who found their jobs through formal means are more likely to quit the job which biases the measure of lagged job satisfaction.

To mitigate this potential shortcoming, the relationship between job search channels and turnover has been investigated. Although panel mortality problems arise if a span of up to five years after the job change is investigated, there is no indicator for a considerable variation in the panel mortality between individuals who found their job via different channels.

Fifth, the employment status and the reason(s) for searching for a new job could be related to both the way individuals search for a job and which job is accepted by individuals. Unemployed individuals, for example, might set a lower aspiration level in the sense of the Simon (1955) model and, thus, accept lower wages than employed job seekers. Additional regressions, though, interacting recruitment sources with the off-the-job dummy did not provide evidence that this effect differs between recruitment channels. However, particularly job satisfaction could be affected by voluntary or involuntary job search. Even if individuals were not unemployed between job changes, it might be important to know whether individuals changed the job voluntarily or involuntarily. In case of voluntary changes, individuals might have more time to find a better job while involuntary changes – either because of single dismissals or due to company closings – are likely to set the individual under pressure to find a new job. This effect, however, should be at least partially covered in the unemployed dummy, since individuals with valuable ties should be more likely to find a new job without interim unemployment, even in case of dismissals.

Finally, this article has not analysed potential selection effects into source usage respectively finding a job through a specific channel. Finding a job through a channel might be non-random but determined by demographic and job-related factors. Therefore, the probability of finding a job through a given channel depends on the search behaviour of employers and job seekers. If this source selectivity is considerably large, source coefficients could be biased.

Albeit all these shortcomings leave space for a more detailed investigation of the topic, the key findings and the propositions as to the relevance of the two hypotheses remain unaffected. Future research should focus in more detail on the search process itself – to be precise – to investigate not only the source through which the job was finally found but the use of all information sources during the search. Additional in-depth analyses of role of the referrer and the relationship towards the job seeker should be conducted.

5.3 Practical Implications

The results have revealed that individuals who found their jobs via social ties do not earn higher wages but are more satisfied with their new jobs compared to those hired via other

channels. Organisations could benefit from satisfied job seekers since job satisfaction is positively related to firm performance in general (Bryson et al., 2015) and soft indicators, e.g. creativity, problem solving, pro-social behaviour, and work engagement (Lyubomirsky et al., 2005).

Empirical findings imply that positive effect on satisfaction might be especially important shortly after the job change, since turnover (interpreted as a clear sign of dissatisfaction) is only weakly related to search channels. Firms, therefore, could benefit from employing job seekers who were suggested by their incumbent employees by gaining more satisfied employees, particularly right after the job change. Hence, this finding appears to be related to the literature on organisational socialisation which describes the adjustment and learning process after entering a new organisation.²⁴ Newcomers who enter an organisation for the first time are confronted with unknown routines, norms, and tasks which creates a feeling of surprise (Louis, 1980) or stress (Nelson, 1987). In order to adjust to the new corporate culture, new entrants are subject to a socialisation process through which they learn their organizational roles (van Maanen, Schein, 1979). Successful socialisation is assumed to have a positive effect on employee (and thus firm) productivity and organisational commitment (Bauer et al., 1998). In addition, employees who socialise quickly and manage to learn all necessary processes might gain a higher level of autonomy (or receive this autonomy quicker) which is linked to job satisfaction (Langfred, Moye, 2004).

Existing research has shown that newcomers rely on peers and direct supervisors in the socialisation process (see e.g. Feldman, Brett, 1983; Louis et al., 1983). Fang et al. (2011) developed a theoretical model in which they connect socialisation theory with social capital theory. The authors argued that newcomers socialise by establishing (particularly weak) social ties to incumbents. This socialisation process can be strengthened by organisational socialisation tactics and is positively affected by newcomer proactivity. Social ties to incumbents could serve helpful in improving and accelerating this process.²⁵ Apart from learning the new organisational role, socialisation and the establishment of new social ties is

²⁴ See Bauer et al. (1998) for a thorough summary view of the literature on organisational socialisation.

²⁵ Fukuyama (2002: 27) defined social capital as “shared norms or values that promote social cooperation, instantiated in actual social relationships”. If socialisation is understood as learning of social norms, existing ties (social capital) between co-workers is likely to improve the socialisation process.

indispensable in order to improve knowledge diffusion and information sharing within organisations (Levin, Cross, 2004).²⁶

Firms can, therefore, benefit from hiring employees via social ties through a shorter integration and learning period of new hires. Moreover, this positive impact on socialisation comes at no costs for firms, since wages of those hired via social ties are not higher than those hired through other channels. Future research could investigate the relationship between finding a job via social ties and organisational socialisation.

6 Conclusion

This article investigated the efficiency of formal and informal recruitment channels as regards wage income, jobs satisfaction, and turnover. Multivariate regression analyses, both cross-sectional and longitudinal, indicate that for the complete sample there are no wage differences due to source choice. Individual Differences between the selected persons are able to explain the wage gap between formal and informal channels. Thus, considerable self-selection of source choice plays a major role. With regard to job satisfaction, results support the positive effect of recommendations. It is assumed that friends or acquaintances are more likely to present a realistic and trustworthy image of the corporation and thus job seekers apply on a well-informed basis. Post-hire job satisfaction increases as the information asymmetries and the gap between expectations and reality is smaller. Only weak evidence for a relationship between social ties and lower turnover rates has been detected. This is interpreted as a positive short term effect of social ties on satisfaction, however, in the long-term, this effect is less relevant. Further sensitivity analyses reveal a more complex relationship between recruitment channels and post-hire outcomes. For example, employees in East Germany gain a significant wage premium of about 12 percent when they found their job on the internet.

As regards the two alternative hypotheses, the results are not easy to interpret. Both considerable self-selection and the higher quality of job-related information seem to play a role. However, branch specific collective wage agreements and company agreements limit employers to pay selected employees above tariff. Thus, in the highly regulated German labour market wage differences for employees recruited via different channels are less likely to occur. Hence, the information function of referrals only affects job satisfaction.

²⁶ Social ties between employees are not always used in favour of the employer. In a sample of 82 nurses, Blau (1985) found that individuals who were more connected to other co-workers were more likely to show withdrawal behaviour defined as unexcused tardiness.

Unfortunately the data do not allow controlling for different kinds of referrals, e.g. family members, friends, or acquaintances. Therefore, future research should focus on the role of the referrer in the job search process. Additional research should be conducted in the field of job search through multiple sources of information.

All in all, the results reveal a positive impact of referrals on job satisfaction. As companies are interested in attracting motivated employees, referrals could act as a means to select workers that fit both job requirements and firm structures. Thus, search through personal contacts enables firms to hire applicants that match the firm's needs out of the faceless mass of job seekers.

Future research could investigate the role of finding a job via social ties on the socialisation process of new hires. Furthermore, the lack of wage differences could either imply that employee matching quality, and thus performance, is not affected by the recruitment source. If those hired via informal means are more performing better, this would imply that the gained surplus is not shared between employer and employee as assumed by Pissarides (1994). This would mean that firms, in contrast to employees, benefit from hiring through informal means via productivity gains without costs.

References

- Aldashev, A., J. Gernandt and S. L. Thomsen (2012): The Immigrant Wage Gap in Germany. *Journal of Economics and Statistics* 232(5): 490-517.
- Antoninis, M. (2006): The Wage Effects from the Use of Personal Contacts as Hiring Channels. *Journal of Economic Behavior & Organization* 59(1): 133-146.
- Arvey, R. D., G. W. Carter and D. K. Buerkley (1991): Job Satisfaction: Dispositional and Situational influences. In: *International Review of Industrial and Organizational Psychology*. Cooper, C. L. and I. T. Robertson: 359-383. Oxford, England, Wiley.
- Aycan, Z., R. N. Kanungo and J. B. P. Sinha (1999): Organizational Culture and Human Resource Management Practices: The Model of Culture Fit. *Journal of Cross-Cultural Psychology* 30(4): 501-526.
- Bachmann, R. and D. Baumgarten (2013): How Do the Unemployed Search for a Job? - Evidence from the EU Labour Force Survey. *IZA Journal of European Labor Studies* 2: 1-25.
- Barber, A. E. (1998): *Recruiting Employees: Individual and Organizational Perspectives*. Thousand Oaks, CA, SAGE.
- Bartolucci, C. (2010): Understanding the Native-Immigrant Wage Gap Using Matched Employer-Employee Data. Evidence from Germany. *Carlo Alberto Working Papers* 150.
- Bauer, T. N., E. W. Morrison and R. R. Callister (1998): Organizational Socialization: A Review and Directions for Future Research. In: *Research in Personnel and Human Resource Management*. Ferris, G. R. 16: 149-214. Greenwich, CT, JAI Press.
- Behtoui, A. (2008): Informal Recruitment Methods and Disadvantages of Immigrants in the Swedish Labour Market. *Journal of Ethnic and Migration Studies* 34(3): 411-430.
- Behtoui, A. and A. Neergaard (2010): Social Capital and Wage Disadvantages Among Immigrant Workers. *Work, Employment and Society* 24(4): 761-779.
- Ben-Porath, Y. (1980): The F-Connection - Families, Friends, and Firms and the Organization of Exchange. *Population and Development Review* 6(1): 1-30.
- Bentollila, S., C. Michelacci and J. Suarez (2010): Social Contacts and Occupational Choice. *Economica* 77: 20-45.
- Bishop, J. (1993): Improving Job Matches in the U.S. Labor Market. *Brooking Papers on Economic Activity*: 335-400.
- Blaschke, D. (1987): Erfolgswege zum neuen Arbeitsplatz. *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung* 20: 164-180.
- Blau, G. J. (1985): Relationship of Extrinsic, Intrinsic, and Demographic Predictors to Various Types of Withdrawal Behaviors. *Journal of Applied Psychology* 70(3): 442-450.
- Boswell, W. R., J. W. Boudreau and J. Tichy (2005): The Relationship Between Employee Job Change and Job Satisfaction: The Honeymoon-Hangover Effect. *Journal of Applied Psychology* 90(5): 882-892.
- Boxman, E. A. W., P. M. De Graaf and H. D. Flap (1991): The Impact of Social and Human Capital on the Income Attainment of Dutch Managers. *Social Networks* 13(1): 51-73.
- Bramoullé, Y. and G. Saint-Paul (2010): Social Networks and Labor Market Transitions. *Labour Economics* 17(1): 188-195.
- Breaugh, J. A. (1981): Relationships Between Recruiting Sources and Employee Performance, Absenteeism, and Work Attitudes. *Academy of Management Journal* 24(1): 142-147.
- Breaugh, J. A. and R. B. Mann (1984): Recruiting Source Effects: A Test of Two Alternative Explanations. *Journal of Occupational Psychology* 57: 261-267.
- Breaugh, J. A. and M. Starke (2000): Research on Employee Recruitment: So Many Studies, So Many Remaining Questions. *Journal of Management* 26(3): 405-434.

- Breaugh, J. A., L. A. Greising, J. W. Taggart and H. Chen (2003): The Relationship of Recruiting Sources and Pre-Hire Outcomes: Examination of Yield Ratios and Applicant Quality. *Journal of Applied Social Psychology* 33(11): 2267-2287.
- Brenzel, H., H. Gartner and C. Schnabel (2014): Wage Posting or Wage Bargaining? Evidence from the Employers' Side. *Labour Economics* 29: 41-48.
- Brück, T. and H. Peters (2009): 20 Years of German Unification: Evidence on Income Convergence and Heterogeneity. *IZA Discussion Paper Series* 4454.
- Bryson, A., J. Forth and L. Stokes (2015): Does Worker Wellbeing Affect Workplace Performance. *IZA Discussion Paper Series* 9096.
- Burdett, K. (1978): A Theory of Employee Job Search and Quit Rates. *The American Economic Review* 68(1): 212-220.
- Cahuc, P., F. Postel-Vinay and J.-M. Robin (2006): Wage Bargaining with On-the-Job Search: Theory and Evidence. *Econometrica* 74(2): 323-364.
- Caliendo, M., R. Schmidl and A. Uhlendorff (2011): Social Networks, Job Search Methods and Reservation Wages: Evidence for Germany. *International Journal of Manpower* 32(7): 796-824.
- Cameron, A. C. and P. Trivedi, K. (2010): *Microeconometrics Using Stata*. College Station, Stata Press.
- Carless, S. A. (2005): Person-Job Fit Versus Person-Organization Fit as Predictors of Organizational Attraction and Job Acceptance Intentions: A Longitudinal Study. *Journal of Occupational and Organizational Psychology* 78(3): 411-429.
- Coleman, J. S. (1988): Social Capital in the Creation of Human-Capital. *American Journal of Sociology* 94: 95-120.
- Delattre, E. and M. Sabatier (2007): Social Capital and Wages: An Econometric Evaluation of Social Networking's Effects. *LABOUR: Review of Labour Economics & Industrial Relations* 21(2): 209-236.
- Destatis (2010): Mikrozensus - Bevölkerung und Erwerbstätigkeit, Stand und Entwicklung der Erwerbstätigkeit in Deutschland. *Fachserie 1 Reihe 4.1.1*.
- Dolbier, C. L., J. A. Webster, K. T. McCalister, M. W. Mallon and M. A. Steinhardt (2005): Reliability and Validity of a Single-item Measure of Job Satisfaction. *American Journal of Health Promotion* 19(3): 194-198.
- Edwards, J. R. (1991): Person-Job Fit: A Conceptual Integration, Literature Review, and Methodological Critique. In: *International Review of Industrial and Organizational Psychology*. Cooper, C. L. and I. T. Robertson. 6: 283-357. Oxford, England, John Wiley & Sons.
- Fang, R., M. K. Duffy and J. D. Shaw (2011): The Organizational Socialization Process: Review and Development of a Social Capital Model. *Journal of Management* 37: 127-152.
- Feldman, D. C. and J. M. Brett (1983): Coping with New Jobs: A Comparative Study of New Hires and Job Changers. *The Academy of Management Journal* 26(2): 258-272.
- Ferrer-i-Carbonell, A. and P. Frijters (2004): How Important is Methodology for the Estimates of the Determinants of Happiness? *The Economic Journal* 114: 641-659.
- Fietze, S. (2011): Arbeitszufriedenheit und Persönlichkeit: "Wer schaffen will, muss fröhlich sein!". *DIW Discussion Papers* 388.
- Fisher, C. D., D. R. Ilgen and W. D. Hoyer (1979): Source Credibility, Information Favorability, and Job Offer Acceptance. *The Academy of Management Journal* 22(1): 94-103.
- Franzen, A. and D. Hangartner (2006): Social Networks and Labour Market Outcomes: The Non-monetary Benefits of Social Capital. *European Sociological Review* 22(4): 353-368.

- Fukuyama, F. (2002): Social Capital and Development: The Coming Agenda. *SAIS Review* XXII(1): 23-37.
- Gernandt, J. and F. Pfeiffer (2008): Wage Convergence and Inequality after Unification: (East) Germany in Transition. *SOEPpapers on Multidisciplinary Panel Data Research* 107.
- Gordon, M. E. and R. D. Arvey (1975): The Relationship Between Education and Satisfaction with Job Content. *The Academy of Management Journal* 18(4): 888-892.
- Granovetter, M. S. (1973): The Strength of Weak Ties. *American Journal of Sociology* 78(6): 1360-1380.
- Granovetter, M. S. (1995): *Getting a Job - A Study of Contracts and Careers*. Chicago, The University of Chicago Press.
- Hamermesh, D. S. (1978): Economic Aspects of Job Satisfaction. In: *Essays in Labor Market Analysis*. Ashenfelter, O. C. and W. E. Oates. New York, Wiley.
- Holzer, H. J. (1988): Search Method Use by Unemployed Youth. *Journal of Labor Economics* 6(1): 1-20.
- IAB (2011): Betriebliche Personalsuche und Stellenbesetzung: Neueinstellungen gelingen am besten über persönliche Kontakte. *IAB-Kurzbericht* 26.
- Johnson, W. R. (1978): A Theory of Job Shopping. *The Quarterly Journal of Economics* 92(2): 261-278.
- Judge, T. A. and S. Watanabe (1994): Individual Differences in the Nature of the Relationship Between Job and Life Satisfaction. *Journal of Occupational and Organizational Psychology* 67: 101-107.
- Judge, T. A., R. F. Piccolo, N. P. Podsakoff, J. C. Shaw and B. L. Rich (2010): The Relationship Between Pay and Job Satisfaction: A Meta-analysis of the Literature. *Journal of Vocational Behavior* 77(2): 157-167.
- Kemmerling, A. and O. Bruttel (2006): 'New politics' in German labour market policy? The implications of the recent Hartz reforms for the German welfare state. *West European Politics* 29(1): 90-112.
- Kirnan, J. P., J. A. Farley and K. F. Geisinger (1989): The Relationship Between Recruiting Source, Applicant Quality, and Hire Performance: An Analysis by Sex, Ethnicity, and Age. *Personnel Psychology* 42(2): 293-308.
- Kitschelt, H. and W. Streeck (2003): From Stability to Stagnation: Germany at the Beginning of the Twenty-First Century. *West European Politics* 26(4): 1-34.
- Korpi, T. (2001): Good Friends in Bad Times? Social Networks and Job Search among the Unemployed in Sweden. *Acta Sociologica* 44(2): 157-170.
- Krug, G. and M. Rebien (2011): Job Search Via Social Networks. An Analysis of Monetary and Non-monetary Returns for Low-skilled Unemployed. *IAB-Discussion Paper* 23.
- Lambert, E. G., N. Lynne Hogan and S. M. Barton (2001): The Impact of Job Satisfaction on Turnover Intent: A Test of a Structural Measurement Model Using a National Sample of Workers. *The Social Science Journal* 38(2): 233-250.
- Langfred, C. W. and N. A. Moyer (2004): Effects of Task Autonomy on Performance: An Extended Model Considering Motivational, Informational, and Structural Mechanisms. *Journal of Applied Psychology* 89(6): 934-945.
- Latham, V. M. and P. M. Leddy (1987): Source of Recruitment and Employee Attitudes: An Analysis of Job Involvement, Organizational Commitment, and Job Satisfaction. *Journal of Business and Psychology* 3(1): 230-235.
- Levin, D. Z. and R. Cross (2004): The Strength of Weak Ties You Can Trust: The Mediating Role of Trust in Effective Knowledge Transfer. *Management Science* 50(11): 1477-1490.

- Locke, E. A. (1976): The Nature and Causes of Job Satisfaction. In: *Handbook of Industrial and Organizational Psychology*. Dunnette, M. D.: 1297-1343. Chicago, Rand McNally.
- Louis, M. R. (1980): Surprise and Sense Making: What Newcomers Experience in Entering Unfamiliar Organizational Settings. *Administrative Science Quarterly* 25(2): 226-251.
- Louis, M. R., B. Z. Posner and G. N. Powell (1983): The Availability and Helpfulness of Socialisation Practices. *Personnel Psychology* 36(4): 857-866.
- Lyubomirsky, S., L. King and E. Diener (2005): The Benefits of Frequent Positive Affect: Does Happiness Lead to Success? *Psychological Bulletin* 131(6): 803-855.
- McPherson, M., L. Smith-Lovin and J. M. Cook (2001): Birds of a Feather: Homophily in Social Networks. *Annual Review of Sociology* 27: 415-444.
- Mendonca, M. and R. N. Kanungo (1994): Managing Human Resources: The Issue of Cultural Fit. *Journal of Management Inquiry* 3(2): 189-205.
- Mobley, W. H., R. W. Griffeth, H. H. Hand and B. M. Meglino (1979): Review and Conceptual Analysis of the Employee Turnover Process. *Psychological Bulletin* 86(3): 493-522.
- Mortensen, D. T. and T. Vishwanath (1994): Personal Contacts and Earnings: It Is Who You Know! *Labour Economics* 1(2): 187-201.
- Moser, K. (2005): Recruitment Sources and Post-hire Outcomes: The Mediating Role of Unmet Expectations. *International Journal of Selection and Assessment* 13(3): 188-197.
- Nelson, D. L. (1987): Organizational Socialization: A Stress Perspective. *Journal of Organizational Behavior* 8(4): 311-324.
- Nickell, S. (1997): Unemployment and Labor Market Rigidities: Europe versus North America. *The Journal of Economic Perspectives* 11(3): 55-74.
- O'Reilly, C. A., J. Chatman and D. F. Caldwell (1991): People and Organizational Culture: A Profound Comparison Approach to Assessing Person-Organization Fit. *Academy of Management Journal* 34(3): 487-516.
- Osberg, L. (1993): Fishing in Different Pools: Job-Search Strategies and Job-Finding Success in Canada in the Early 1980s. *Journal of Labor Economics* 11(2): 348-386.
- Pellizzari, M. (2010): Do Friends and Relatives Really Help in Getting a Good Job? *Industrial & Labor Relations Review* 63(3): 494-510.
- Pervin, L. A. (1968): Performance and Satisfaction as a Function of Individual-Environment Fit. *Psychological Bulletin* 69(1): 56-68.
- Pesek, J. G. and C. McGee (1988): Recruitment Source as a Factor Affecting Turnover & Performance in Hospitals. *The Journal of Applied Business Research* 4(1): 167-172.
- Pissarides, C. A. (1994): Search Unemployment with On-the-job Search. *The Review of Economic Studies* 61(3): 457-475.
- Plug, E., B. van der Klaauw and L. Ziegler (2015): Do Parental Networks Pay Off? Linking Children's Labor-Market Outcomes to their Parents' Friends. *IZA Discussion Paper Series* 9074.
- Porter, L. W. and R. M. Steers (1973): Organizational, Work, and Personal Factors in Employee Turnover and Absenteeism. *Psychological Bulletin* 80(2): 151-176.
- Rees, A. (1966): Information Networks in Labor Markets. *American Economic Review* 56(2): 559-566.
- Rode, J. C. (2004): Job Satisfaction and Life Satisfaction Revisited: A Longitudinal Test of an Integrated Model. *Human Relations* 57(9): 1205-1230.
- Schwab, D. P. (1982): Organizational Recruiting and the Decision to Participate. In: *Personnel Management*. Rowland, K. M. and G. R. Ferris: 103-128. Boston, Allyn and Bacon.

- Simon, H. A. (1955): A Behavioral Model of Rational Choice. *The Quarterly Journal of Economics* 69(1): 99-118.
- Simons, H. W., N. N. Berkowitz and R. J. Moyer (1970): Similarity, Credibility, and Attitude Change: A Review and a Theory. *Psychological Bulletin* 73(1): 1-16.
- SOEP Group (2015): SOEP 2014 - Documentation of Person-related Status and Generated Variables in PGEN for SOEP v31. *SOEP Survey Papers* 292: Series D.
- Taylor, M. S. and D. W. Schmidt (1983): A Process-Oriented Investigation of Recruitment Source Effectiveness. *Personnel Psychology* 36(2): 343-354.
- Tazelaar, F. (1990): Die Verarbeitung langfristiger Arbeitslosigkeit. In: *Empirischer Theorienvergleich - Erklärungen sozialen Verhaltens in Problemsituationen*. Opp, K.-D. and R. Wippler: 191-228. Opladen, Westdeutscher Verlag.
- TÜV Rheinland (2015). Aktuelle Breitbandverfügbarkeit in Deutschland (Stand Mitte 2015).
- Ullman, J. C. (1966): Employee Referrals: Prime Tool for Recruiting Workers. *Personnel* 43(2): 30-35.
- UNESCO (2006): ISCED 1997: International Standard Classification of Education.
- van Maanen, J. and E. H. Schein (1979): Toward a Theory of Organizational Socialization. In: *Research in organizational behavior*. Staw, B. M. 1: 209-264. Greenwich, CT, JAI.
- Vatter, J. (2012): Well-being in Germany: What Explains the Regional Variation. *SOEP Papers* 435.
- Wagner, G. G., J. R. Frick and J. Schupp (2007): The German Socio-Economic Panel Study (SOEP) - Scope, Evolution and Enhancements. *Schmollers Jahrbuch* 127(1): 139-170.
- Wanous, J. P. (1978): Realistic Job Previews: Can a Procedure to Reduce Turnover also Influence the Relationship Between Abilities and Performance? *Personnel Psychology* 31(2): 249-258.
- Wanous, J. P., A. E. Reichers and M. J. Hudy (1997): Overall Job Satisfaction: How Good Are Single-Item Measures? *Journal of Applied Psychology* 82(2): 247-252.
- Williams, C. R., C. E. Labig Jr and T. H. Stone (1993): Recruitment Sources and Posthire Outcomes for Job Applicants and New Hires: A Test of Two Hypotheses. *Journal of Applied Psychology* 78(2): 163-172.
- Winter, S. (1997): Personalbeschaffung durch Mitarbeiter, Selbstselektion und Vetterwirtschaft. *Zeitschrift für Personalforschung* 11(3): 247-262.
- Zellner, A. (1962): An Efficient Method of Estimating Seemingly Unrelated Regressions and Tests for Aggregation Bias. *Journal of the American Statistical Association* 57(298): 348-368.
- Zellner, A. and D. S. Huang (1962): Further Properties of Efficient Estimators for Seemingly Unrelated Regression Equations. *International Economic Review* 3(3): 300-313.
- Zellner, A. (1963): Estimators for Seemingly Unrelated Regression Equations: Some Exact Finite Sample Results. *Journal of the American Statistical Association* 58(304): 977-992.
- Zottoli, M. A. and J. P. Wanous (2000): Recruitment Source Research: Current Status and Future Directions. *Human Resource Management Review* 10(4): 353-382.