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ABSTRACT

Job mobility is inherently risky as workers have limited ex ante information about the quality of outside jobs. Using a large longitudinal Dutch dataset, which includes data on risk preferences elicited through an (incentivized) lottery-choice experiment, we examine the relation between risk aversion and job mobility. The evidence shows that risk averse workers are less likely to move to other jobs. The results are stronger for male workers and for workers who hold a permanent contract. Our empirical findings indicate that the negative relation between risk aversion and job mobility is driven by the job acceptance rather than the search effort decision.

1. Introduction

Although most decisions involve risk, this is particularly true in the labor market. This study focuses on a risky decision that is relevant to almost all workers and that may have major consequences for the individual's career path: the decision to quit and move to another job. According to canonical models on job mobility, uncertainty plays a crucial role in explaining mobility processes: there is uncertainty about whether the worker will be able to find a better job (Burdett, 1978; Mortensen, 1986) and about the quality of outside jobs (Jovanovic, 1979). Because workers have limited information about many aspects of the new job, they may realize that they ended up in a poor match after accepting an outside job offer. The premise that job mobility is risky is also consistent with the empirical literature, showing that job mobility can be an important source of wage growth (le Grand and Tåhlin, 2002; Schmelzer, 2012; Topel and Ward, 1992), but may also lead to wage losses or lower wage growth (Borjas, 1981; Light and McGarry, 1998; Tjaden and Wellschmied, 2014). Because job mobility is inherently risky, it can be expected that risk preferences affect the decision to move to another job.

This paper examines the relation between risk aversion and job mobility. Given that uncertainty plays a central role in canonical models for the analysis of turnover, it is surprising that the role of risk aversion in turnover decisions has been largely ignored in the labor economics literature. Existing theoretical models generally assume risk neutral individuals or homogeneous risk preferences. Allowing for heterogeneity in risk preferences, we demonstrate theoretically that risk

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Table 1
Choices in the lottery task.

	All		Incentivized		Hypothetical	
	Men	Women	Men	Women	Men	Women
Panel A: Fraction choosing the certain payoff						
Game # (€ certain payoff)						
Game 1 (20)	32.80	46.92	29.30	43.09	37.58	51.63
Game 2 (25)	41.67	60.70	37.21	61.70	47.77	59.48
Game 3 (30)	58.33	69.50	57.21	70.74	59.87	67.97
Game 4 (35)	73.92	80.94	73.49	81.38	74.52	80.39
Game 5 (40)	81.18	87.68	79.07	87.77	84.08	87.58
Panel B: Average number of safe choices						
Nr of safe choices	2.88	3.46	2.76	3.45	3.04	3.47

Notes: In all five games, when the risky option is chosen the subject receives either € 5 or € 65 (both outcomes occur with a 50% chance).

aversion is negatively related to job mobility. There are two potential channels through which job mobility is affected by risk aversion: the job acceptance channel and the job search channel. First, given the uncertainty associated with outside jobs, risk averse workers are more critical about outside job offers. Hence, conditional on receiving an offer risk averse workers are more likely to decline an offer. Second, due to the higher probability of rejecting outside offers, the marginal gains from search are lower for risk averse workers and they will therefore search less intensively. Moreover, risk averse workers will invest less in search because this is a risky investment activity involving short-run costs and uncertain benefits.

We examine the relation between risk aversion and job mobility using the LISS, a longitudinal panel from the Netherlands. Given the longitudinal nature of the data we are able to follow individual labor market trajectories over time, which allows us to analyze job mobility behavior. Moreover, as the data contains information about (on-the-)job search behavior, we are able to test one of the channels through which risk aversion is related job mobility. A unique feature of the data is that in addition to information on labor market behavior and a wide range of background characteristics, the LISS panel includes various measures of risk preferences. We exploit a measure of risk aversion that is elicited through an (incentivized) lottery-choice experiment as well as several survey questions on the respondent's willingness to take risks.

The evidence indicates that workers who are more risk averse are less likely to be mobile on the labor market. This finding appears not to be crucially dependent on the risk aversion measure: both the results based on the lottery-choice experiment data and the results based on the survey questions on risk aversion point out a negative relation between risk aversion and job mobility. Overall, this relation appears to be stronger for men and when job mobility involves more uncertainties. The evidence from the lottery-choice experiment does not indicate that risk aversion decreases on-the-job search effort, which suggests that the negative relation between risk aversion and job mobility is driven by the job acceptance decision: risk averse workers are more likely to reject outside offers. Surprisingly, some of the estimation results show that more risk averse workers search more intensively on-the-job. An explanation for this finding is that on-the-job search is not only used to generate outside job offers (as assumed in on-the-job search models), but also to obtain more information about the quality of potential job offers and the individual's labor market position. Search may thereby decrease uncertainties involved in job mobility.

Our study contributes to a growing literature testing the effects of risk aversion on labor market outcomes. Existing studies have examined how risk aversion is related to educational and occupational choice (Bonin et al., 2007; Falco, 2014; Fouarge et al., 2014), migration decisions (Bauernschuster et al., 2014; Dustmann et al., 2017; Goldbach and Schlüter, 2018; Heitmueller, 2005; Jaeger et al., 2010), reservation wages of unemployed job seekers (Feinberg, 1977; Pannenberg, 2010), wage growth (Budria et al., 2013; Shaw, 1996) and the decision to become (and remain) an entrepreneur (Caliendo et al., 2010; 2009; Koudstaal et al., 2015; Skriabikova et al., 2014).[1] Empirical evidence on the relation between risk aversion and job mobility is virtually non-existent. To our knowledge, Maier et al. (2016) is the only other study that tests the relation between risk attitudes and job mobility empirically.[2] Using the German Socio-Economic Panel Survey, Maier et al. (2016) find that more risk-tolerant individuals move more often from one job to another. However, they rely on a survey question on risk attitudes rather than experimental data to capture heterogeneity in risk aversion and do not test the relation between risk aversion and on-the-job search effort. In general, most studies on the relation between risk aversion and labor market behavior rely on survey-based questions on risk attitudes to capture variation in risk preferences (Koudstaal et al. (2015) and Goldbach and Schlüter (2018) are exceptions). In addition to examining the predictive value of risk aversion in a new domain, one of the strengths of our approach is that we use an experimentally elicited measure of risk aversion for a relatively large sample of field subjects.

[1] A related strand of literature examines how risk aversion affects technology adoption decisions (e.g. Liu, 2013).

[2] The idea that job mobility is a risky decision is mentioned in several economic studies but never examined explicitly. For instance, Tom et al. (2007) state: "Many decisions, such as ... to accept a new job, involve the possibility of gaining or losing relative to the status quo. When faced with such decisions, most people are markedly risk averse." Outside the field of economics, the study of Allen et al. (2007) discusses the role of risk attitudes and derives several propositions drawing (mainly) on the psychological literature. However, the study does not test these propositions empirically.

Furthermore, this study contributes to the literature on turnover and labor market dynamics by providing new insights in the determinants of turnover. Turnover is a relevant economic variable, as it affects wages and careers (Blau and DeVaro, 2007; Dustmann and Pereira, 2008; Topel and Ward, 1992): the results may therefore provide a new explanation for wage inequality. Given the evidence indicating a significant intergenerational correlation of risk attitudes (Dohmen et al., 2012), the study sheds light on a new mechanism explaining (low levels of) intergenerational income mobility. In addition, turnover has an impact on firm productivity (Ilmakunnas et al., 2005; Jackson, 2013; Siebert and Zubanov, 2009) and is relevant for the (allocative) efficiency of the labor market (Mortensen, 2011). The paper demonstrates that heterogeneity in preferences are important, and that (policy) evaluations assuming risk neutrality or a single risk aversion parameter (representative agent models) produce incomplete results.

The paper is structured as follows. The next section discusses the theoretical mechanisms through which risk aversion affects job mobility. Next, the data is discussed and the empirical results are presented. The final section concludes.

2. Theory

2.1. Theoretical models on job mobility

The benchmark theoretical models of turnover in economics are based on imperfect information. Borjas and Goldberg (1978) already pointed out the relevance of uncertainty in the job mobility process: "it is likely that uncertainty both before and after search about firms and workers and the on-the-job learning process which reduces this uncertainty is an important characteristic of the labor market" (Borjas and Goldberg, 1978, p. 124). In the current theoretical literature, we can distinguish between two general models: on-the-job search models, where jobs are search goods (e.g. Burdett, 1978; Mortensen, 1986), and learning models, where jobs are experience goods (Johnson, 1978; Jovanovic, 1979; 1984). According to the first type of models, workers search for other jobs and when an offer is located they accept it if the value (wage) of the alternative job is higher than the value of the current job. On-the-job search models assume that workers have imperfect information before search takes place but perfect information about the job once it has been located. Hence, there is no ex ante uncertainty about the value of an offered job. In contrast, learning models are based on the assumption that workers have no or limited ex ante information about the value of the job: the worker learns about the value of the new job (quality of the job match) while on the job. As pointed out by Jovanovic (1979, p.973), the fundamental difference between these models is that in models where jobs are pure search goods job mobility is due to the arrival of new information about alternative job opportunities, whereas in models where jobs are pure experience goods turnover is the result of obtaining new (negative) information about the current job.

In existing theoretical models on job mobility heterogeneity in risk preferences plays no role since risk neutrality or a single risk aversion parameter (representative agent models) is assumed. However, given the uncertainty involved in job mobility it is likely that heterogeneity in risk preferences explains turnover. Based on the two main theoretical models, we can distinguish between two channels through which risk aversion affects job mobility. First, in on-the-job search models search can be considered as an investment involving costs (mainly in terms of time and effort) and uncertain rewards (in terms of locating a good job offer). More risk averse workers are less willing to engage in investment activities such as on-the-job search and are therefore less likely to receive outside offers. Second, in learning models where jobs are considered as experience goods, the job acceptance rather than the job search decision is affected by the individual's degree of risk aversion. Because it is impossible to completely evaluate the value of the job before accepting the offer, the worker faces the risk of accepting a poor job match. The more certain option would be to stay and reject the uncertain job offer. Hence, risk averse workers are less likely to quit and move to another job as they invest less in job search activities and are more critical about alternative job offers. However, it is plausible that search costs are quantitatively small and that the potential losses associated with unsuccessful search are limited. In contrast, the potential losses of accepting a 'lemon' are substantial. Hence, we argue that job mobility is risky mainly because it is impossible to completely evaluate the value of the job before accepting an offer and that the role of risk aversion is more relevant in models where jobs are considered as experience goods. In the spirit of these models, we present below a model in a rather stylized form that shows how risk aversion affects job mobility. In Section 2.3 we discuss the relation between risk aversion and on-the-job search more extensively.

2.2. Risk aversion and the job acceptance decision

The model follows the central premise of the model of Jovanovic (1979): the individual has more information about the current job than about outside job opportunities and new information arrives while on the job. To capture the idea of ex ante uncertainty about match quality, we assume that each period the worker receives an alternative offer y, which indicates the match-specific value of the job drawn from the cumulative distribution function $F(y)$. Since many uncertainties about a job involve non-pecuniary characteristics, the job has a particular value in terms of utility and is not simplified to the wage level (which is generally observed before accepting the offer). The value of the match contains all aspects of the job that generate (dis)utility for holding the job, such as income, working hours, work atmosphere and commuting time. The true value of the job offer is not observed when the worker receives an offer. Instead, workers receive a noisy signal $\hat{y} = y + \varepsilon$.

The noise term ε is stochastically independent of y and has mean zero and variance σ_ε^2.[3] For simplicity, we assume a zero discount rate. Furthermore, we assume that the worker has perfect information about the current job match and that the value of the job is immediately revealed when the job is accepted.

Conditional on receiving an outside offer, a worker accepts the job only if the observed signal of the job $\hat{y}$ is higher than the reservation match quality $\hat{y}^*$. The worker is indifferent between rejecting and accepting the offer if:

$$V(y_0) = E\left[V(y)|\hat{y} = \hat{y}^*\right] \tag{1}$$

where $V(y_0)$ is the utility value of the current job match y_0 and $E[V(y)|\hat{y} = \hat{y}^*]$ represents the expected utility value of the reservation match quality $\hat{y}^*$. We assume that workers are risk averse, i.e. $V'(.) > 0, V''(.) < 0$. Risk averse workers have a positive risk premium Π which is implicitly defined in the following equation:

$$E\left[V(y)|\hat{y} = \hat{y}^*\right] = V\left[E\left(y|\hat{y} = \hat{y}^*\right) - \Pi\right] \tag{2}$$

Eqs. (1) and (2) imply:

$$E\left(y|\hat{y} = \hat{y}^*\right) = y_0 + \Pi \tag{3}$$

Note that $E(y|\hat{y} = \hat{y}^*)$ is a (possibly non-linear) function of $\hat{y}^*$: $E(y|\hat{y} = \hat{y}^*) = g(\hat{y}^*)$. Under the assumption that $g(.)$ is a monotonically increasing function,[4] we can write down the following expression for the reservation match quality $\hat{y}^*$:

$$\hat{y}^* = h(y_0 + \Pi) \tag{4}$$

where $h(.) = g^{-1}(.)$ and $h'(.) > 0$. If we assume that y and ε are normally distributed, we can rewrite Eq. (4) as Eq. (A.4) (see Appendix A). Eq. (4) implies that the reservation match quality increases with the individual's risk premium. Obviously, more risk averse workers ask a higher premium Π to accept the new job than a less risk averse worker.[5] Consequently, more risk averse workers are more selective about job offers and are less mobile between jobs. Moreover, it can be shown that (for small risks) the relevance of risk aversion in the job acceptance decision positively depends on the noise of the signal σ_ε^2 (see also Eq. (A.4)).[6] The interaction between risk aversion and noise is intuitive: if the quality of the match can be perfectly observed (i.e. when jobs are pure search goods, $\sigma_\varepsilon^2 = 0$), then job mobility involves no uncertainty ($\hat{y} = y$) and, according to Eq. (1), $\hat{y}^* = y_0$ and $\Pi = 0$. In that case, risk aversion does not affect the job acceptance decision.

2.3. Risk aversion and the job search decision

The model so far describes the worker's choice conditional on receiving an alternative offer. In the model the effect of risk aversion on job mobility operates through the job acceptance decision. The analysis implicitly assumes that the job offer arrival rate is exogenous. However, in on-the-job models the intensity of search effort plays an important role as it determines the probability of receiving an offer. On-the-job search includes all kinds of activities that increase the chances of locating and receiving an offer: the worker has to search for available vacancies and prepare for and actively attend job interviews. These activities involve time and effort and are often experienced as stressful.

Theoretically, on-the-job search involves costs and uncertain future rewards: search is unsuccessful when no job offer is received or when an offer is below the worker's reservation match quality. Given that search is an investment activity with uncertain rewards, risk averse workers are more reluctant to make such investments. So even if jobs are pure search goods, one may expect that risk averse workers invest less in on-the-job search and for that reason are less mobile between jobs. When risk averse workers set a higher reservation match quality (as discussed above), they are more likely to reject a job offer conditional on receiving one. This implies that the marginal gains from search decline with the worker's degree of risk aversion. Hence, risk aversion may affect on-the-job search through two channels: risk averse workers are less likely to invest in activities with uncertain rewards and have lower expected gains from search as they are more likely to reject potential offers (see Appendix A for a more formal discussion).

2.4. Discussion

Several factors are not explicit in the basic theoretical model but may be relevant in actual job mobility processes. First, we have assumed that staying is less risky than moving. Although it is likely that the worker knows more about his current job than about others jobs, this assumption may not always hold in reality. In general, we may expect that the current match offers more employment protection than the alternative match as firing costs increase with tenure and workers may have obtained a permanent contract. This is especially relevant in the European context, where often large differences in employment protection exist between workers on permanent contracts and their temporary counterparts. Permanent workers may have to sacrifice their employment protection if they move to another job, so for these workers quitting is

[3] See also Dustmann et al. (2016) for an interesting application of uncertainty in the job mobility process: their model allows productivity to be match specific and as in our model this is observed with a noisy signal before the worker accepts the job. However, the model assumes risk neutrality.

[4] This seems to us a plausible assumption because y and $\hat{y}$ are positively correlated ($cov(y, \hat{y}) = cov(y, y + \varepsilon) = \sigma_y^2 > 0$).

[5] See e.g. proposition 1.5 of Eeckhoudt, Gollier and Schlesinger (2005).

[6] See e.g. proposition 1.3 of Eeckhoudt, Gollier and Schlesinger (2005).

indeed likely to involve more risks than staying. In contrast, staying in a temporary job may involve more uncertainties than moving. In practice, the probability that workers on a temporary contract are retained by their employer is relatively small (compared to their permanent counterparts). Because it is not risky to leave a sinking ship, the relation between risk aversion and mobility is ambiguous for temporary workers. Hence, while our model assumes that the current match y_0 involves no uncertainty, in reality workers on temporary contracts may be subject to more uncertainty when staying instead of leaving. We examine empirically whether risk aversion matters more for workers on a permanent contract (see Section 4.2).

Second, the worker's opportunity to mitigate a potential loss if the new match turns out to be poor may be relevant. When the worker has accepted a 'lemon', he or she may of course search for another job. The time it will take to find another offer, and therefore the size of the loss due to job mobility, depends on the labor market conditions. In case of a tight labor market, alternative job offers are relatively easy to find: this implies that when a worker ends up in a bad job match, the worker can simply quit and move to another job. So, when many vacancies are available, turnover is less risky because a potential negative outcome can be offset by accepting another job within a short period of time. Even risk averse individuals may not prefer one bird in the hand if there are plenty in the bush. For that reason we expect that in a tight labor market job mobility is less risky and the relation between risk aversion and mobility is weaker. We therefore test this prediction in Section 4.2.

Another issue concerns the labor market function of on-the-job search. As in existing on-the-job search models, in the model discussed above search intensity affects the job arrival rate. A function of job search that is generally ignored in the literature is that search increases the information about potential job offers and thereby the precision of the noisy signal $\hat{y}$.[7] Hence, σ_{ε}^2 may be reduced by searching more intensively. Eq. (A.4) indicates that, by decreasing the noise of the signal, search decreases the reservation match quality (if $\left[y_0 - \mu_y + \frac{1}{2}A_{\hat{y}^*}\right] > 0$) and increases the probability that search will generate an acceptable job offer. Due to the interaction between risk aversion and the noise of the signal these potential additional benefits of search are more relevant for more risk averse workers. The intuition is that the value of information about job offers and future labor market opportunities increases with risk aversion. This mechanism suggests a positive rather than a negative relation between risk aversion and on-the-job search. For that reason it is possible that risk averse workers search more intensively on-the-job but at the same time are more critical about job offers. To test this empirically, we estimate the relation between risk aversion and on-the-job search effort (Section 4.4).

A final issue is related to human capital investments. As pointed out by Shaw (1996), risk aversion may affect human capital decisions (and thereby income growth). She argues that more risk averse workers invest less in (firm-specific) human capital because the returns of such investments are uncertain. In case we allow for turnover in the human capital model, these decisions become interdependent as the worker sacrifices his firm-specific human capital when he separates. An important question is how this may affect the theoretical predictions on turnover. On the one hand, following Shaw's argument, risk averse workers invest less in firm-specific human capital and may therefore be more likely to leave their current job. This suggests that the relation between risk aversion and turnover is positive rather than negative. On the other hand, following search and learning models, risk averse workers are more likely to stay and therefore have stronger incentives to invest in firm-specific human capital. If they do so, this mechanism reinforces the negative effect on job mobility as higher levels of firm-specific human capital decrease incentives to leave the current firm. We therefore argue that it is not obvious how allowing for firm-specific human capital affects our main predictions on the relation between risk aversion and job mobility.

3. Data and methodology

To test the relation between risk aversion and job mobility empirically, we make use of the LISS (Longitudinal Internet Studies for the Social sciences) survey, a representative Dutch panel that is in operation since 2007 and includes around 4500 households (around 7000 individuals). LISS contains several studies, including the 'Work and Schooling' core study that includes questions on labor market outcomes and behavior. Because LISS participants receive reimbursement for completing the survey, the payment infrastructure can be used for conducting incentivized experiments.

We measure risk aversion using data from a lab-in-the-field experiment from the LISS study by Noussair et al. (2013). In December 2009, 3457 LISS respondents (59.2%) participated in an experiment where they had to make 17 binary choices in lottery games (see Appendix A and Noussair et al. (2013) for more details about the experiment). Here we focus on the five games that aim to capture risk aversion (the others are on higher order risk aversion). These five games basically represent a multiple price list, which follows a similar procedure as previous studies measuring risk aversion (e.g. Dohmen et al., 2010; Holt and Laury, 2002) except that subjects are asked to indicate their preference in all games rather than their switching point. In these games, the subjects had to choose between a certain and a risky option, where the risky option always implied a 50% chance of earning 5 and a 50% chance of earning 65 euro. The certain payoff varied from 20 to 40 euro, which was presented in a step-wise manner (with steps of € 5) to the subjects on separate screens.[8] Following the previous

[7] The theoretical model discussed by Dustmann et al. (2016) allows for this to some extent. In their model, a more precise signal of the match specific productivity is received when the job match is realized through a referral.

[8] The order of the games was counterbalanced: half of the subjects follow the sequence game 1- game 5, while the order is reversed for the other half of the subjects. Also whether the option 'left' or 'right' was the certain or risky option was counterbalanced.

literature (Holt and Laury, 2002; Noussair et al., 2013, 2014), we capture heterogeneity in risk aversion by the number of safe choices.[9]

About 40% of the subjects (almost 1400) were incentivized through a lottery: one out of ten incentivized subjects was selected as a winner.[10] In case the subjects were incentivized, it was stressed in the instructions that the subjects could actually earn money. Next, one of the 17 choices was randomly selected and the outcome of the game was paid to the subject. The potential payoffs were between 10 and 150 euros. For the remaining 60% of the subjects, the games involved hypothetical payoffs: half of this group faced hypothetical payments that are identical to the incentivized condition, in the other half the hypothetical payments are increased by factor 150. While there are significant differences in risk aversion levels between the incentivized and hypothetical condition (Mann–Whitney test: $z = -4.764$, $p < 0.001$), this effect appears to be driven by the non-incentivized condition with high (scaling $\times 150$) hypothetical payoffs: subjects in the high hypothetical condition opt significantly more often for the certain payoff.[11] There are no significant differences in risk aversion between subjects in the incentivized versus those in the hypothetical payoffs treatment when the stake sizes were identical (Mann–Whitney test: $z = 0.426$, $p = 0.670$). In our analysis we therefore focus on subjects that were in treatments with normal payoffs (incentivized and hypothetical; $N = 2460$).

Our main analysis focuses on job mobility between the 2010 wave (i.e. the first wave after the experiment) and the 2011 wave of the LISS panel. Our analytical sample consists of individuals who participated both in the experiment and the 2010 LISS section containing information about the respondent's job (i.e. the section 'Work and Schooling', measured in April/May) ($N = 1767$), are between the ages 20 and 65 in wave 2000 ($N = 1338$) and are employed at least 16 h per week in the 2010 wave ($N = 950$). Moreover, we include only individuals for which job mobility can be measured (i.e. individuals who are not observed in 2011 are excluded; below we explain in more detail how we measure job mobility). Our final sample consists of 713 individuals (372 men and 341 women) when we use a set of basic controls in our regressions. The number of observations is somewhat lower when a more extensive set of controls is used.

Table 1 presents the decisions of the subjects in our analytical sample. Theoretically, risk neutral agents opt for the certain payoff in Game 5, are indifferent between the certain and risky option in Game 4 (both have an expected value of € 35) and prefer the risky payoff in Game 1–3. Risk averse individuals opt for the certain payoff in Game 4 and 5 and depending on their degree of risk aversion may prefer the certain payoff in Games 1–3 as well. A risk seeking individual prefers the risky payoff in Game 1–4. The table shows that most individuals prefer the safe option in Game 4 and 5. The expected value of the risky option is equal to the certain payoff in Game 4: a large majority prefers the certain payoff. Moreover, for both genders and in both experimental conditions, the majority chooses the certain payoff in Game 3 where the expected value of certain payoff is lower than that of the risky payoff. Hence, the results indicate that most individuals are risk averse. Moreover, the table clearly shows that women opt more often for the certain payoff. The number of safe choices, our main risk aversion measure, is significantly higher for women than for men (Mann–Whitney test: $z = -4.80$, $p < 0.001$, in the total sample). The finding that women are more risk averse than men is consistent with most field and experimental studies (Croson and Gneezy, 2009).

Fig. 1 shows the distribution of our main risk aversion measure by gender and experimental condition. Risk averse agents would prefer the safe outcome at least two times (Game 4 and 5), whereas risk seeking individuals prefer the risky payoff in at least four games (Game 1–4). Again, these figures clearly indicate that most individuals are risk averse and that women are more risk averse than men.

In addition to a measure of risk aversion elicited through the lottery-choice experiment, LISS contains survey items on attitudes towards risks. In August 2010, respondents were asked about their willingness to take risks on an 11-point scale, where 0 means the respondent is "highly risk averse" and 10 indicates the respondent is "fully prepared to take risks".[12] These questions are asked concerning risk taking in general and for three specific domains (financial, occupation and leisure). We recoded this item so that a higher value indicates a higher degree of risk aversion. The correlation between the experimentally elicited risk aversion measure and these risk attitude measures is statistically significant but relatively weak (between 0.13 and 0.19, depending on the specific item). However, several studies point out that these questions predict behavior across various domains (e.g. Bonin et al., 2007; Caliendo et al., 2009; Dohmen et al., 2011; Fouarge et al., 2014; Jaeger et al., 2010; Skriabikova et al., 2014). We test the robustness of our results using this alternative, survey-based measure of risk aversion. The distribution of this risk aversion measure is presented in Fig. 2. Also according to this measure, women are significantly more risk averse (Mann–Whitney test: $z = -3.96$, $p < 0.001$).

We test the relation between risk aversion and the probability to move from one employer to another with multinomial logit models. We consider the 2010 wave as the base wave and distinguish between three labor market states in wave 2011:

[9] Alternatively, we can construct the certainty equivalent of the decisions and use this as a measure for risk aversion. However, this measure can only be generated for individuals who made monotonic decisions, which would imply a considerable decrease in the number of observations. Nevertheless, we test the robustness of our results using a certainty equivalent risk aversion measure (see Section 4.3).

[10] The strategy of randomly selecting winners is followed in several other large-scale (representative) experiments (Dohmen et al., 2011; Harrison et al., 2007; Von Gaudecker et al., 2011). Abdellaoui et al. (2011) show that random selection of winners generates stronger incentives than paying all subjects a small amount.

[11] Holt and Laury (2002) also provide evidence that scaling up the payment level increases the share of individuals choosing the safer option, though they mainly found this when choices are incentivized.

[12] The phrasing of the question is: "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?". These questions were part of the LISS section 'Commercial Opportunities'.

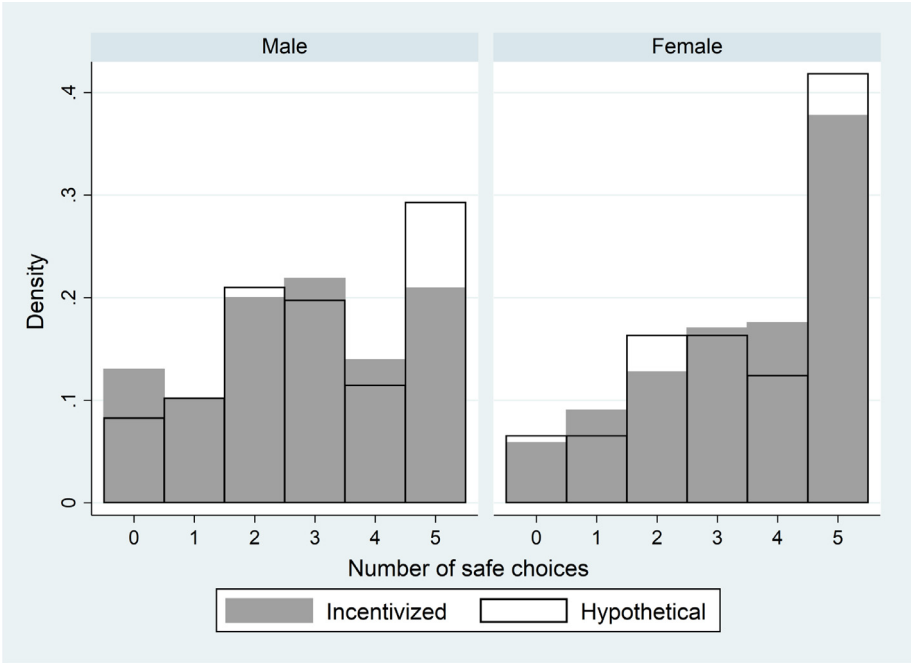

Fig. 1. Risk aversion by gender and experimental condition (lottery-choice).

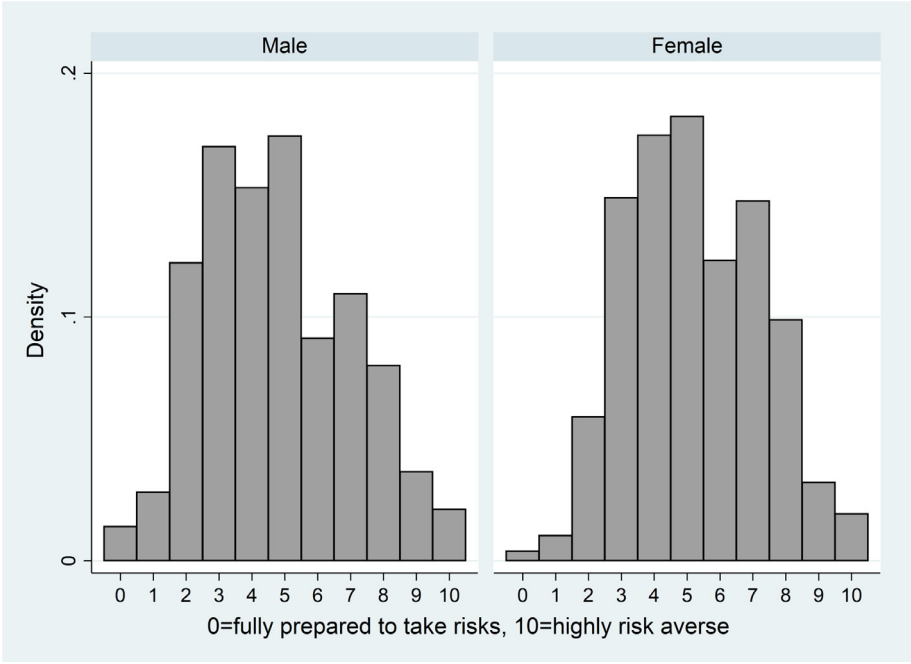

Fig. 2. Risk aversion by gender (survey question).

the worker is employed at the same employer as in 2010, moved to another employer or is no longer employed.[13] Because the LISS does not contain information on the exact date of termination of the job, the exact duration of completed spells cannot be measured accurately. We therefore use the panel structure of the data and information about the year and month

[13] Theoretically, workers can also move to self-employment. However, transitions from regular employment to self-employment are rare (less than 0.5% in our analytical sample). Caliendo et al. (2009) test the relation between risk aversion and the transition to self-employment using the German SOEP. In their sample 78 out of 6979 (1.1%) individuals moved from regular employment to self-employment between 2004 and 2005. For this reason, Caliendo et al. (2009) use rare events logit models.

Table 2
Labor market transitions between 2010 and 2011.

Position in 2011	All ($N = 713$)	Incent. ($N = 403$)	Hypo. ($N = 310$)	Men ($N = 372$)	Women ($N = 341$)
Same job	87.80	87.84	87.74	86.56	89.15
Other job	6.73	6.95	6.45	6.45	7.04
Not employed	5.47	5.21	5.81	6.99	3.81

Table 3
Risk aversion and mobility (lottery-choice).

	Probability of moving to another job					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Pooled						
Risk aversion	−0.0131**	−0.0112**	−0.0206**	−0.0170**	−0.00805	−0.00804
	(0.00581)	(0.00520)	(0.00811)	(0.00709)	(0.00822)	(0.00820)
Observations	713	657	403	367	310	290
Panel B: Men						
Risk aversion	−0.0161**	−0.0124*	−0.0205*	–	−0.0139	–
	(0.00771)	(0.00678)	(0.0110)		(0.0114)	
Observations	372	350	215		157	
Panel C: Women						
Risk aversion	−0.0107	−0.0117	−0.0225*	–	−0.000624	–
	(0.00882)	(0.00728)	(0.0127)		(0.0119)	
Observations	341	307	188		153	
Exp. cond.	Both	Both	Incent.	Incent.	Hypo.	Hypo.
Controls	Basic	Full	Basic	Full	Basic	Full

Notes: The dependent variable indicates whether the worker remained employed at the same employer (0), moved to another employer (1) or is no longer employed (2) in year $t + 1$. Entries represent average marginal effects (standard errors in parentheses) from multinomial logit regressions on the probability of moving to another employer, where remaining employed at the same employer is the base category. In the models presented in column (1), (3) and (5) only basic controls are included (age, spouse, child present, educational level, year dummies), whereas the models with full controls (column (2), (4) and (6)) include a more extensive list of controls: see Appendix Table C1 for the results of the complete model.
$^{**}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

of hiring to infer whether the worker moved from one job to another between 2010 and 2011. If the worker is employed at the same employer in both waves, the worker experienced no job mobility. Workers are classified as mobile between two jobs when they moved to another job in year 2011 or in year 2010, if the month of hiring was after the interview month of the 2010 wave (April/May). As we have no information about the reason why the worker left the employer, the variable captures both voluntary and involuntary job mobility.[14] Around 6–7% of the workers experience job mobility between the two consecutive waves (see Table 2). Women move somewhat more frequently between jobs than men (7 versus 6.5%) although this difference is not statistically significant. As expected (given randomization of treatment), there is no significant difference in job mobility between workers in the incentivized versus those in the hypothetical payment sample.

We include a number of controls in our multinomial logit regressions. Since risk aversion may also affect the individual's occupational choice, one may consider job and firm characteristics as bad controls. However, results controlling for these features provides insight in the relation between risk aversion and job mobility conditional on job and firm characteristics. We therefore estimate two different models: one with several basic individual controls (age, whether the respondent has a spouse, presence of children in the household, educational level and year dummies) and one where we, in addition to the basic controls, include controls for job and firm characteristics as well as controls for urbanization and home ownership[15]: see Table B1 for the descriptive statistics of these variables.

4. Results

4.1. Main results

The main findings using data from the lottery-choice experiment are presented in Table 3. The estimation results for the pooled sample (Panel A) show that there is a negative and significant relation between risk aversion and the probability

[14] However, the data does contain information that we can use to test whether involuntary mobility drives the results, see Section 4.3.

[15] Controlling for home ownership is important as home ownership is likely to affect the job mobility decision (by creating mobility costs) and, as buying a home may be considered as an investment, is likely to be correlated with the individual's degree of risk aversion. Unfortunately, the data does not contain information about the region of residence.

Table 4
Risk aversion and mobility (survey question).

	Probability of moving to another job			
	(1)	(2)	(3)	(4)
Panel A: Pooled				
Risk aversion	−0.00550*	−0.00625**	−0.00821**	−0.0111***
	(0.00317)	(0.00313)	(0.00373)	(0.00429)
Observations	985	985	985	985
Panel B: Men				
Risk aversion	−0.0102**	−0.00860**	−0.0159***	−0.0214**
	(0.00454)	(0.00386)	(0.00585)	(0.00850)
Observations	474	474	474	474
Panel C: Women				
Risk aversion	0.000159	−0.00280	−0.000946	−0.00488
	(0.00439)	(0.00478)	(0.00499)	(0.00532)
Observations	511	511	511	511
Domain[a]	General	Financial	Occupation	Leisure
Controls	Basic	Basic	Basic	Basic

Notes: The dependent variable indicates whether the worker remained employed at the same employer (0), moved to another employer (1) or is no longer employed (2) in year $t+1$. Entries represent average marginal effects (standard errors in parentheses) from multinomial logit regressions on the probability of moving to another employer, where remaining employed at the same employer is the base category. All models include the basic list of controls: see Table E1 for the results from models including the full list of controls.
[a]Domain refers to survey questions regarding the individual willingness to take risk in the respective domain.
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

to move to another job.[16] One additional safe choice in the lottery-choice experiment is associated with an increase in the job mobility rate of around 1.3 percentage point (column (1)). Given that around 7% of workers change jobs between two consecutive waves, the size of the estimated marginal effect is nontrivial. This relation is marginally affected by including job and firm characteristics, though the effect size becomes somewhat smaller. Moreover, the effect size is larger for the incentivized sample than for the hypothetical payoff sample, where the relation between risk aversion and job mobility is insignificant. The finding that the relation between risk aversion and job mobility is driven by the incentivized sample suggests incentivizing decreases the noise of the risk aversion measure and therefore matters for empirical analysis. However, it should be noted that the number of observations is somewhat lower in the hypothetical payoff sample and that the risk aversion coefficient for the incentivized sample is not statistically significant different from the risk aversion coefficient for the hypothetical payoff sample.[17]

Panel B and C of Table 3 contain the results for men and women, respectively.[18] The results for men are comparable to the pooled sample results, with statistically significant negative effects in the incentivized sample and statistically insignificant effects in the hypothetical payoff sample. Overall, the results for men are stronger than the results for women. However, for women the marginal effects are negative in all specifications and statistically significant ($p < 0.01$) in the incentivized sample. A potential explanation for the somewhat weaker results for women could be that most Dutch women work part-time and are the second earner in the household. Moving to another job may in that case not involve substantial risks, as the worker can use the income of the spouse to partially insure against the risk of ending up in a bad match. A related explanation is that women may have lower work attachment and therefore do not consider job changes as a major risk. However, additional analyses do not provide support for this explanation. We tested, for instance, whether risk aversion is a relevant determinant of job mobility for women who work in larger jobs (e.g. at least 24 or 32 h). Another explanation is that the variation in our measures of risk aversion is smaller for women than for men.

We are able to compare our main results based on an experimentally elicited risk aversion measure with results using survey-based risk aversion items. The findings using these alternative indicators of risk preferences confirm our results reported above (see Table 4).[19] In the pooled sample (Panel A) as well as in the sample of male workers (Panel B), risk aversion is significantly negatively associated with job mobility. These results hold across specifications using four different risk aversion questions. However, when we use a more extensive list of controls, the results become weaker (see Table E1) but the marginal effects of risk aversion remain negative in all and significant in several specifications. Interestingly, results

[16] In contrast, risk aversion is not significantly related to the probability of moving to the state of non-employment (see Table C1).
[17] We tested this by running a regression using the pooled sample and including an interaction term of the risk aversion measure and a dummy indicating whether the individuals was in the incentivized sample. The coefficient of this interaction term is insignificant.
[18] Due to the relatively small number of observations in the incentivized and hypothetical payoff subsamples of male and female workers, some of the models with the extensive list of controls suffer from collinearity. We therefore do not present the results based on these subsamples using the extensive list of controls.
[19] The results presented in Table 4 are based on regressions including the basic list of controls.

Table 5
Risk aversion and mobility: heterogeneous effects.

	Probability of moving to another job					
	(1)	(2)	(3)	(4)	(5)	(6)
ME of risk aversion at:						
Permanent contract	−0.0120**	−0.00992*	−0.0203**	−0.0186**	−0.00682	−0.00574
	(0.00599)	(0.00551)	(0.00902)	(0.00748)	(0.00760)	(0.00777)
Temporary contract	−0.0246	−0.0183	−0.0208	−0.00877	−0.0326	−0.0343
	(0.0198)	(0.0157)	(0.0189)	(0.0140)	(0.0425)	(0.0468)
Observations	712	657	402	367	310	290
ME of risk aversion at:						
Low vacancy rate	−0.0193**	−0.0160*	−0.0193	−0.0121	−0.0215*	−0.0278**
	(0.00841)	(0.00830)	(0.0122)	(0.0123)	(0.0119)	(0.0118)
High vacancy rate	−0.00418	−0.00738	−0.0190	−0.0230**	0.00656	0.00813
	(0.00914)	(0.00813)	(0.0118)	(0.0106)	(0.0141)	(0.0131)
Observations	713	657	403	367	310	290
Experimental cond.	Both	Both	Incent.	Incent.	Hypo.	Hypo.
Controls	Basic	Full	Basic	Full	Basic	Full

Notes: Results are based on the pooled (men and women) sample. The dependent variable indicates whether the worker remained employed at the same employer (0), moved to another employer (1) or is no longer employed (2) in year $t+1$. Entries represent average marginal effects (standard errors in parentheses) from multinomial logit regressions on the probability of moving to another employer, where remaining employed at the same employer is the base category. In the models presented in column (1), (3) and (5) only basic controls are included (age, spouse, child present, educational level, year dummies), whereas the models with full controls (column (2), (4) and (6)) include a more extensive list of controls.
$^{**}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

based on standardized lottery-choice and survey risk aversion measures show that the effect size of the general risk aversion question is similar to the effect size obtained using the lottery-choice risk aversion measure (see Table E2): a one standard deviation increase in risk aversion increases job mobility by 2.2 or 1.8 percentage points using the number of safe choices in the lottery-choice experiment (column (1)) or the question concerning risk aversion in the occupation domain (column (6)), respectively. As for the results based on the lottery-choice experiment, the results for women (Panel C) are also weaker when using the survey items as an alternative risk aversion measure: within the sample of female workers, risk aversion is not significantly associated with job mobility.

4.2. Heterogeneous effects

In addition to the main relation between risk aversion and job mobility, we may expect that the relation is stronger under certain circumstances. In Section 2.4 we discussed two sources of effect heterogeneity: the effect of risk aversion on job mobility can be expected to be stronger a) among permanent workers than among temporary workers; and b) in weak labor markets. To test these predictions, we interact risk aversion with a dummy indicating whether the worker is on a temporary or permanent contract, and with an indicator of the tightness of the labor market. We capture the tightness of the labor market using industry-specific vacancy rates, obtained from CBS Statistics Netherlands. The vacancy rate indicates the number of vacancies per 1000 jobs in the industry. We use the vacancy rate measured in the second quarter of 2010, which varies between 6 and 34. We match the vacancy rate data with the LISS data.[20] We define weak (low vacancy rate) and tight (high vacancy rate) labor markets using the median value of this indicator. Given that this analysis exploits between-industry variation, we exclude the industry controls from these regressions.

Table 5 presents the average marginal effects of risk aversion estimated for workers on different contracts and in weak versus tight labor markets, allowing for an interaction effect between risk aversion and the contract dummy and risk aversion and the vacancy rate dummy, respectively (the results for the male and female subsamples are presented in Table E4). Consistent with our theoretical predictions, the results indicate that risk aversion is a significant determinant of turnover among permanent but not among temporary workers.[21] This suggests that workers holding a stable, permanent position consider job mobility as a risky decision, whereas temporary workers may be in an uncertain, more precarious state where moving to another job does not necessarily involve more risks than staying. However, it should be noted that the coefficient of the interaction term between risk aversion and the type of contract is insignificant, indicating that the effects do not significantly differ between temporary and permanent workers. Furthermore, the evidence presented in columns (1)-(2) and (5)-(6) indicates that the marginal effect of risk aversion is larger in case of weak labor markets (i.e. when the vacancy rate is low); the estimates reported in column (4), however, are not consistent with the theoretical expectations. We also tested

[20] The LISS data distinguishes between 15 different industries (including 'other'). We are able to perfectly match data for ten industries; for four industries we use the average vacancy rate of a larger industry category that includes the relevant industry but also one or several other related industries; for the industry category 'other' we use the national average vacancy rate. See Table E3 for more details.

[21] The effect size is typically larger for temporary workers. This may be explained by the fact that workers on a temporary contract are more mobile between jobs.

for heterogeneous effects using the risk aversion survey questions (see Tables E5 and E6), but these results appear to be less consistent than the results using the lottery-choice measure.

4.3. Robustness tests

In this section we discuss to what extent our main results are sensitive to using alternative model specifications. First, in our main analysis we focus on job mobility between 2010 and 2011. Alternatively, we can measure whether a worker has moved to another job between 2010 and 2012, between 2010 and 2013, and so on: see Table E7 for the estimation results. Due to panel attrition, the number of observations decreases with the time period over which job mobility is measured (e.g. 462 observations in the models predicting job mobility in the 2010–2016 period; column (1) of Table E7). However, the results are consistent with our main findings: risk aversion is negatively associated with the probability of moving to another job, and this association is significantly negative in the incentivized sample but not in the hypothetical payoff sample.

Second, we test to what extent panel attrition drives our main estimates. Individuals who participated in the lottery-choice experiment and were employed in wave 2010 but did not participate in the 2011 wave of the LISS are excluded from our main regression analyses. However, a potential concern is that our results are biased if risk aversion is systematically related to panel attrition. In addition to being in the same job, moved to another job or left employment, we included attrition as a fourth state in our multinomial logit model to test whether panel attrition affects our results. The estimates based on this alternative model specification are in line with our main findings, although the size of the marginal effect becomes somewhat smaller (see Table E8). Moreover, risk aversion appears not to be significantly associated with panel attrition between wave 2010 and 2011. Hence, these results indicate that panel attrition does not matter critically.

Third, we used a more strict measure of (voluntarily) job mobility. As we have demonstrated above, the relation between risk aversion and job mobility is driven by permanent workers. Given that permanent workers are well protected in the Netherlands and face a relatively low layoff risk, it is unlikely that involuntary job mobility drives our results. However, we further test for this using additional information on job search motivation: workers who search for another job are asked why they do so. One of the potential reasons is that they will (probably) lose their current job. We obtain similar results if we do not classify as (voluntarily) mobile those individuals stating this as a reason for job search.

Fourth, we examined to what extent our main results are sensitive to using alternative measures of risk aversion. For those who made consistent choices in the lottery-choice experiment, we can approximate certainty equivalents (CE) by using the midpoint between the two certain payoffs where the individual switched from preferring the risky choice to the certain payoff (or the other way around for those facing the games in reversed order) (e.g. Sutter et al., 2013). We define risk aversion as $1 - CE/35$, with negative values indicating risk loving and positive values indicating riks aversion. The results using this alternative measure are qualitatively similar to our main results (see Table E9). Interestingly, the relation between risk aversion and job mobility is also significantly negative in the hypothetical payoff sample. This can be explained by the selection of the sample: only those individuals who made consistent choices in the lottery-choice experiment are included in these analyses and for this group the number of safe choices is probably a more precise measure of risk aversion.

Finally, risk preferences may be correlated with time preferences, which may affect the decision to move to another job. In general, evidence suggests that risk aversion is positively related with patience (i.e. risk averse workers have lower discount rates) (Sutter et al., 2013). However, existing evidence on the relation between time preferences and job mobility is inconclusive.[22] Although the LISS does not contain experimental measures of time preferences, some of the survey questions may capture variation in time preferences.[23] Including such questions does hardly change our main finding that risk aversion is negatively related to job mobility within our (male) sample.

4.4. Does job search intensity drive the results?

Theoretically, both on-the-job search models and learning models predict that more risk averse workers are less mobile between jobs. However, the models differ fundamentally in terms of the underlying mechanisms. On the one hand, in the on-the-job search model investing in job search is a risky activity as the individual has no ex ante information about job offers. Once an offer is located, there is no uncertainty about the value of the job. Risk averse workers are less likely to move to other jobs because they are less likely to search and receive offers. On the other hand, learning models are based on the assumption that individuals have no or only limited ex ante information about outside jobs. Based on these models, risk averse workers are more critical about (uncertain) outside job offers and are therefore less likely to accept offers. Hence, risk aversion may affect job mobility through the job search decision, the job acceptance decision, or both.

Although the LISS data does not contain information about acceptance or rejection of job offers, there is information available about job search activities of the respondents. In the previous literature, job search effort has been measured by the time spent on search activities (Krueger and Mueller, 2010), the number of applications in the past month(s) (van der Klaauw and van Vuuren, 2010), the number of job search channels (Manning, 2009) or a combination of some

[22] Based on the NLSY, Cadena and Keys (2015) show that impatient individuals move more frequently between jobs, whereas van Huizen and Alessie (2015) found no evidence for such a relation between time preferences and job mobility using the Dutch DHS data.

[23] For instance, the LISS includes items such as 'I am always prepared' and 'I get chores done right away' (both answered on a 5-point scale).

Table 6
Risk aversion and on-the-job search.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Applied 0/1 (Probit)							
Risk aversion	0.00326	0.00431	0.00305	−0.00606*	−0.00104	−0.00384	−0.00494
	(0.00394)	(0.00512)	(0.00637)	(0.00319)	(0.00272)	(0.00304)	(0.00325)
Observations	706	399	307	972	972	972	972
Risk aversion	0.0252***	0.0222*	0.0331**	−0.0321***	−0.0171***	−0.0223***	−0.0253***
	(0.00910)	(0.0119)	(0.0151)	(0.00685)	(0.00573)	(0.00638)	(0.00683)
Observations	706	399	307	972	972	972	972
Risk aversion	0.0131	0.0196*	0.00327	−0.0254***	−0.0116**	−0.0139**	−0.0194***
	(0.00836)	(0.0118)	(0.0121)	(0.00632)	(0.00531)	(0.00584)	(0.00640)
Observations	713	403	310	983	983	983	983
Exp./Domain[a]	Exp.	Exp.	Exp.	General	Financial	Occupation	Leisure
	(Both)	(Incent.)	(Hypo.)				

Notes: Entries represent average marginal effects (standard errors in parentheses). All models include the basic list of controls.
[a]Exp. refers to the experimental condition (incentivized or hypothetical payments); Domain refers to survey questions regarding the individual willingness to take risk in the respective domain.
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

of these indicators (Bloemen, 2005; van Huizen and Alessie, 2015). Here we use three indicators of on-the-job search intensity that are available in the LISS: whether the worker applied for another job in the past two months; the number of applications in the past two months; and the number of job search channels the worker has used in the past two months. We estimate the relation between risk aversion and these job search indicators using probit (when using the job application dummy as dependent variable) and Poisson models (when using the number of applications or search channels as dependent variable). We use the basic set of controls in the job search specifications.

The results based on the lottery-choice experiment are presented in columns (1)–(3) of Table 6.[24] Surprisingly, the results indicate that risk aversion is positively associated with on-the-job search effort: risk averse workers apply more frequently to other jobs and risk averse workers use a larger number of search channels. However, when we use the survey-based risk aversion measures instead (columns (4)–(7)), we obtain opposite results: the relation between risk aversion and the number of job applications and search channels is significantly negative. While the results using data from the lottery-choice experiment are inconsistent with the theoretical predictions derived from on-the-job search models and learning models, the evidence based on the survey-based risk aversion measures does provide support for the predictions. These findings point out that the alternative measures capture different dimensions of attitudes towards risks.

A potential explanation for the findings reported in columns (1)–(3) could be that workers search on-the-job to avoid unemployment rather than to move to another job voluntarily. To test this explanation, we excluded individuals who were not employed in 2011. The results indeed indicate that this is a relevant explanation (see Table E12): the relation between risk aversion and job search effort is insignificant when the lottery-choice measure is used, but negative and in several specifications significant when the survey-based measure is used. An explanation for the insignificant relations could be that the costs of search are relatively small. In that case, losses due to unsuccessful search are trivial. In contrast, accepting a new job implies sacrificing the current (certain) position and moving to another (uncertain) position: the potential losses generated by this decision are substantial. Although this may explain why the relation between risk preferences and search is insignificant while at the same time the relation between risk preferences and job mobility is negative, it does not explain why risk averse workers search more intensively on-the-job. An alternative explanation that may reconcile the findings on both job mobility and on-the-job search effort is that workers use on-the-job search as a strategy to decrease uncertainty about their future labor market position. Workers may search to obtain information about available jobs and their labor market prospects, thereby decreasing the uncertainty involved with the mobility decision. When jobs are a combination of search and experience goods, searching may reduce the ex ante uncertainty about the quality of potential job offers. Search may not only affect the job offer arrival rate, but may also decrease the risks related to turnover by generating a more precise signal about job offers. This can explain why risk averse workers may search more intensively on-the-job while they are at the same time less likely to move to another job.

As the evidence suggests that risk aversion affects job mobility mainly through the job acceptance channel, risk averse workers are expected to move to better jobs in case they switch to another employer. We tested this prediction by regressing (log) hourly wage growth (Table E13, Panel A) and the change in job satisfaction (Table E13, Panel B) on risk aversion. The results do not indicate that more risk averse worker move to jobs that are significantly better in terms of wages or job satisfaction. However, it should be noted that these models rely on variation in wage or job satisfaction growth within the group of mobile workers. Given that job mobility is rather uncommon and the sample size is relatively small, these specifications are probably underpowered.

[24] Tables E10 and E11 show the results for the male and female subsamples.

In conclusion, the job mobility estimates relying on the survey-based risk aversion measures can be explained by a job search channel: more risk averse workers search less intensively on-the-job and may therefore be less mobile between jobs. Conversely, we argue that our main result based on the lottery-choice experiment, i.e. the negative relation between risk aversion and job mobility, is driven by the job acceptance decision rather than by a negative effect on job search effort as the findings show that risk averse workers do not search less (but potentially more) intensively for other jobs.

5. Conclusion and discussion

This paper examines the relation between risk aversion and job mobility. Workers have little ex ante information about outside job offers and therefore quitting their current job and moving to a new one is a risky decision. Moreover, searching for another job involves costs and uncertain rewards and may therefore be considered as a risky investment activity. Theoretically, we therefore expect that risk averse workers shy away from search activities, are more critical about potential outside offers, and consequently move less frequently from one job to another.

We test these predictions by combining data on risk aversion elicited through experiments with longitudinal data on actual labor market behavior. The empirical findings are consistent with the theoretical predictions: risk averse workers are less likely to be mobile on the labor market. These findings are confirmed by results based on survey questions measuring attitudes towards risks. Overall, the results are stronger for men than for women. In line with our predictions, the effects of risk aversion on job mobility are stronger when the worker holds a permanent contract. Furthermore, the findings show that the effects are stronger in the sample that faces real monetary payments in the experiments rather than hypothetical payments. Interestingly, some of the findings indicate that risk averse workers search more intensively for other jobs.

As the findings show that heterogeneity in risk aversion explains differences in job mobility patterns, they may explain differences in the income distribution as well: the empirical results provide a new explanation for existing income inequality. Hence, risk averse individuals may not only select in different occupations or types of education, but also follow different career paths once they have entered the labor market. Because risk averse workers are more likely to stay at their current employer, they may climb the ladder using the internal labor market (i.e. through promotions). Wage growth of more risk seeking workers is more likely the result of external job mobility.

The empirical results indicate that the relation between risk aversion (measured in the lottery-choice experiment) and turnover is not driven by higher search intensity. This suggests that the job acceptance decision is the central mechanism through which risk preferences affect mobility behavior. Our findings are consistent with the idea that individuals not only search on-the-job to receive a job offer, but also to decrease ex ante uncertainty about the quality of outside jobs. This function of job search has remained unexplored in the labor economics literature and deserves further research.

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Appendix A. Theoretical model

A.1. Job acceptance decision assuming normality

If we assume that y and ε are normally distributed, the risk premium Π is given by:

$$\Pi = \frac{1}{2}\frac{\sigma_\varepsilon^2}{\sigma_y^2+\sigma_\varepsilon^2}A_{\hat{y}^*} \tag{A.1}$$

with Arrow-Pratt (Pratt, 1964) degree of risk aversion $A_{\hat{y}^*}$:

$$A_{\hat{y}^*} = \frac{-V''\left(E\left(y|\hat{y}=\hat{y}^*\right)\right)}{V'\left(E\left(y|\hat{y}=\hat{y}^*\right)\right)} \tag{A.2}$$

Using Eq. (A.1), Eq. (2) can be written as:

$$E\left(y|\hat{y}=\hat{y}^*\right) = y_0 + \frac{1}{2}\frac{\sigma_\varepsilon^2}{\sigma_y^2+\sigma_\varepsilon^2}A_{\hat{y}^*} \tag{A.3}$$

Given that y and ε are normally distributed, one can write $E(y|\hat{y}=\hat{y}^*) = \frac{\sigma_\varepsilon^2}{\sigma_y^2+\sigma_\varepsilon^2}\mu_y + \frac{\sigma_y^2}{\sigma_y^2+\sigma_\varepsilon^2}$. From Eq. (A.3) we can derive that the reservation match quality is given by:

$$\hat{y}^* = y_0 + \frac{\sigma_\varepsilon^2}{\sigma_y^2}\left[y_0 - \mu_y + \frac{1}{2}A_{\hat{y}^*}\right] \tag{A.4}$$

A.2. On-the-job search

On-the-job search s involves costs $c(s)$, which is an increasing convex function of s, and determines the job arrival rate λs, where λ is a constant parameter ($\lambda > 0$) indicating the individual's efficiency of on-the-job search. The optimal level of on-the-job search effort is determined by setting the marginal costs of search ($c'(s)$) equal to the marginal benefits of search:

$$c'(s) = \lambda E \int_{\hat{y}^*}^{\bar{y}} [V(y) - V(y_0)] dF(y) = \lambda \left[1 - F\left(\hat{y}^*\right)\right]\left[E\left(V\left(y|\hat{y} > \hat{y}^*\right)\right) - V(y_0)\right] \tag{A.5}$$

First, assume that risk aversion does not affect the reservation match quality $\hat{y}^*$. It is clear that risk averse workers search less intensively for other jobs than risk neutral workers because:

$$\left[1 - F(\hat{y}^*)\right]\left[E\left(V\left(y|\hat{y} > \hat{y}^*\right)\right) - V(y_0)\right] < \left[1 - F\left(\hat{y}^*\right)\right]\left[V\left(E\left(y|\hat{y} > \hat{y}^*\right)\right) - V(y_0)\right] \tag{A.6}$$

The intuition behind this prediction is that search is an investment activity with uncertain rewards: risk averse workers are more reluctant to make such investments. As we have established in Section 2.2 that, conditional on receiving an offer, the reservation match quality increases with risk aversion, risk aversion also negatively affects the probability of successful search and thereby the marginal gains of search (the right-hand-side of Eq. (A.5)). Consider an individual with a low degree of risk aversion ($A^L_{\hat{y}^*}$) and an individual with a high degree of risk aversion ($A^H_{\hat{y}^*}$). Eq. (4) implies that, conditional on receiving a job offer, the more risk averse individual will be more critical about job offers ($\hat{y}^*_H > \hat{y}^*_L$) and is therefore more likely to reject a job offer. The marginal gains from search are therefore lower for high risk averse workers:

$$\begin{aligned} \lambda E \int_{\hat{y}^*_L}^{\bar{y}} [V(y) - V(y_0)] dF(y) &= \lambda E \int_{\hat{y}^*_L}^{\hat{y}^*_H} [V(y) - V(y_0)] dF(y) + \lambda E \int_{\hat{y}^*_H}^{\bar{y}} [V(y) - V(y_0)] dF(y) \\ &> \lambda E \int_{\hat{y}^*_H}^{\bar{y}} [V(y) - V(y_0)] dF(y) \end{aligned} \tag{A.7}$$

Appendix B. Descriptive statistics

Table B1
Descriptive statistics.

	Mean	SD
Risk aversion	3.12	1.63
Age	44.46	10.80
Spouse present	0.81	0.40
Child present	0.52	0.50
Low level of education	0.29	0.46
Medium level of education	0.28	0.45
High level of education	0.42	0.49
Urban area (1–5)	2.96	1.25
Home owner	0.82	0.39
Temporary contract	0.09	0.29
Working hours	32.88	7.70
Tenure (months)	153.44	130.87
Job satisfaction	7.45	1.38
Public sector	0.41	0.49
Occupational level:[a]		
Occupational level: Low	0.19	0.39
Occupational level: Medium	0.66	0.47
Occupational level: High	0.14	0.35
Industry:[b]		
Industry A	0.28	0.45
Industry B	0.25	0.43
Industry C	0.46	0.50
Firm size (nr of employees)		
Firm size unkn./ < 100	0.58	0.49
Firm size 100–499	0.25	0.43
Firm size > 500	0.17	0.37

Notes: The table provides descriptive statistics of the pooled samples of the regressions with the full list of controls ($N = 657$; Table 3, Panel A, Column (2)).

[a]Low level of occupation includes skilled, supervisory, semi-skilled, unskilled and trained manual work and agrarian professions. Medium level of occupation includes intermediate academic, intermediate supervisory and commercial professions and other mental work. High level of occupation includes higher academic and higher supervisory profession.

[b]Industry A includes government services, public administration, education, healthcare, welfare, environmental services, culture and recreation, and other industries; B includes agriculture, mining, industrial production, utilities and construction; C includes retail trade, catering, financial and business services, transport, storage and communication.

Appendix C. Estimation results

Table C1
Main estimation results.

	Transitions (base outcome: same job)			
	Outcome: Other job (1)	Outcome: Non-employed (2)	Outcome: Other job (3)	Outcome: Non-employed (4)
Risk aversion	−0.220**	0.150	−0.225**	−0.0148
	(0.0974)	(0.123)	(0.102)	(0.139)
Female	−0.0846	−0.777**	0.136	−0.639
	(0.314)	(0.361)	(0.436)	(0.454)
Age	−0.0949***	−0.00948	−0.0382**	0.0442*
	(0.0158)	(0.0197)	(0.0192)	(0.0267)
Spouse present	−0.0149	−0.422	0.536	−0.116
	(0.405)	(0.383)	(0.582)	(0.510)
Child present	0.105	−0.948***	0.169	−1.123**
	(0.337)	(0.356)	(0.375)	(0.438)
Level of education:				
(Ref: Low)				
Medium	0.225	−0.540	0.429	−0.120
	(0.439)	(0.421)	(0.507)	(0.508)
High	0.370	−1.307***	0.393	−0.484
	(0.391)	(0.453)	(0.462)	(0.544)
Urban area			0.105	−0.232
			(0.162)	(0.162)
Home owner			0.0865	−0.459
			(0.572)	(0.484)
Temporary contract			1.036**	0.992
			(0.471)	(0.607)
Working hours			0.0376	−0.0334
			(0.0299)	(0.0289)
Tenure (months)			−0.0122***	−0.00300
			(0.00321)	(0.00201)
Job satisfaction			−0.212**	−0.179
			(0.106)	(0.117)
Public sector			−0.163	−0.907
			(0.528)	(0.686)
Occupational level:[a]				
(Ref: Low)				
Medium			−0.0974	0.0898
			(0.582)	(0.489)
High			−0.390	−1.033
			(0.809)	(1.189)
Industry:[a]				
(Ref: Industry A)				
Industry A			−0.842	0.668
			(0.643)	(0.695)
Industry B			0.386	0.382
			(0.545)	(0.639)
Firm size (nr of employees)				
Firm size 100–499			0.387	0.269
			(0.367)	(0.459)
Firm size > 500			0.118	0.947*
			(0.562)	(0.566)
Constant	1.558**	−1.258	−0.511	−0.547
	(0.718)	(1.096)	(1.632)	(2.320)
Observations	713	713	657	657

Notes: Entries represent coefficients of multinomial logit regressions (standard errors in parentheses).
[a]See notes Table B1 for the description of this variable.
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Supplementary material

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jebo.2019.01.021.

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