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Training in two-tier labor markets: The role of job match quality

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ABSTRACT

This study examines training investments in two-tier labor markets, focusing on the role of job match quality. Temporary workers are in general more likely than permanent workers to leave their employer and therefore are less likely to receive employer-funded training. However, as firms prefer to continue productive job matches, we hypothesize that the negative effect of holding a temporary contract on the probability to be trained diminishes with the quality of the job match. Using a recent longitudinal survey from the Netherlands, we find that temporary workers indeed participate less frequently in firm-sponsored training. However, this effect is fully driven by mismatches: holding a temporary contract does not significantly decrease the probability to receive training for workers in good job matches. Depending on match quality, a temporary job can either be a stepping stone or a dead-end.

1. Introduction

During the 1980s, intensifying international competition and high unemployment rates generated the need to increase the flexibility of European labor markets. Many European countries responded to this need by a strategy of two-tier reforms, which relaxed the restrictions on the use of temporary contracts but left the employment protection for permanent contracts essentially unchanged (e.g. Boeri and Garibaldi, 2007; Shire et al., 2009). As a result of these marginal reforms, firms have substituted permanent for temporary workers (Kahn, 2010). The number of temporary jobs has grown dramatically: in 2013 16% of the workers (over 24 million) were on temporary contracts in EU-28 countries (Eurostat, 2014).

A concern that has been raised both in previous literature (Arulampalam and Booth, 1998; Barbieri, 2009; Fuller and Stecy-Hildebrandt, 2015) and policy debates (OECD, 2013b, 2014) is that temporary workers may be trapped in precarious careers. Particularly, the training opportunities of these employees may be limited as firms are unwilling to pay for human capital investments when the time horizon over which they can recoup the training costs is relatively short. This concern is generally supported by empirical evidence from various countries, such as the UK (Arulampalam and Booth, 1998; Booth et al., 2002; Green, 1993), Spain (Albert et al., 2005), Ireland (O'Connell and Bryne, 2012), Belgium (Forrier and Sels, 2003) and the Netherlands (Fouarge et al., 2012). Since temporary contracts play a central role in the adjustment process of the labor market, training and retraining are especially important for workers in such contracts as they need up-to-date skills to find new jobs.

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The main contribution of this study is to examine the critical role of match quality in the relation between flexibility and training. We argue that training, flexibility and match quality are highly interrelated. Flexibility may not only affect training decisions directly, as shown in previous studies, but also indirectly through the matching process. According to canonical search and matching models (e.g. Burdett, 1978; Mortensen, 2011), the labor market allocates workers to jobs through a process of efficient turnover: mismatches lead to quits or lay-offs, so the firm and worker will search for better matches. Efficient turnover results in a better allocation of workers to jobs, thereby improving job matches and enhancing the overall productivity of an economy (e.g. Jackson, 2013; Jovanovic, 1979). An important rationale for increasing labor market flexibility (i.e. removing institutional rigidities) is to stimulate this efficient turnover and increase the allocative efficiency of the labor market (Adnett et al., 2004). Because the quality of the job match determines whether or not the worker will stay at the firm, it will also influence the pay-back period of human capital investments and thereby the employer's training decision. As firms wish to keep productive matches, we hypothesize that the negative effect of having a contract diminishes with the quality of the job match. The central question in this study is therefore whether access to training is limited for temporary workers in general or just for those who are in relatively poor matches.

For the empirical analysis we use data from the Netherlands, a country that followed a strategy of two-tier reforms and experienced a substantial growth in temporary employment as a result. The effects are estimated using LISS data (2008–2014), a longitudinal survey that contains information on the respondents' training activities, employment contract as well as indicators for match quality. We measure the quality of the job match using data on job satisfaction and test the robustness of the results using information on tenure and perceived job security. To examine whether the effect of having a temporary contract is different for employees in bad and good job matches, we take into account the interaction effects between the type of the employment contract and match quality.

2. Institutional background

The Dutch system can be characterized by a relatively high share of temporary workers and a substantial gap in protection between permanent and temporary workers. The OECD evaluates the strictness of employment protection legislation (EPL) for temporary and permanent workers on the basis of 21 dimensions. The EPL index for permanent workers is a weighted average for scores on severance pay, difficulty of dismissal, notification periods and procedural inconveniences. According to the OECD EPL index, the Netherlands has one of the most strict systems for the dismissal of permanent workers: the Dutch EPL ranks third, stricter than the German, Italian and French system (OECD, 2013a,b).[1] The high score on the index is to a large extent driven by procedural inconveniences.

The dismissal procedure itself is somewhat complicated by the two different dismissal routes available to Dutch firms.[2] The employer can fire an employee after receiving a layoff permit from the public employment services ('UWV') or by going to civil court. If a permission is granted by the UWV, the firm has to respect the notice period but is not required to pay severance payments. The layoff route via the court involves severance pay and is therefore more expensive.[3] Severance pay can be substantial when the fired worker is older and has a long tenure. For instance, the standard compensation for a 55-year old employee with 20 years of tenure is 30 times the monthly salary. Hence, the UWV procedure is lengthier and involves more red tape, whereas the court route leads generally to higher financial costs. Although in some years one route is more common than the other, over a longer period of time it seems that both routes are used with about the same frequency. Since 2006, a large share of the employment contracts has been dissolved through mutual consent in addition to the UWV and court route.

While EPL for employees holding a permanent contract is strict in the Netherlands, the country has one of the more flexible legislations for temporary employment in Europe – alongside the UK, Austria, Sweden and Ireland (OECD, 2013a,b, 2014). Fixed-term contracts and temporary agency work were reorganized by the 1999 Flexibility and Security Act ('Flexwet'). This reform relaxed various restrictions on the use of fixed-term contracts and temporary agency work. Fixed-term contracts, which make up by far the largest share of temporary contracts, can for instance be used for jobs that may be permanent. In general, fixed-term contracts can be extended twice but the cumulative duration is limited to 36 months. The national law, however, does not apply to all employees since it can be superseded by collective bargaining agreements. For instance, the maximum cumulative duration of fixed term contracts is 72 instead of 36 months for academic staff members at Dutch universities.

Since the introduction of the Flexwet, the share of temporary workers has grown considerably, from over 13% in 2000 to over 18% in 2012.[4] This growth in the temporary employment rate is mainly driven by the increase in the use of fixed-term contract (from less than 6% in 2000 to over 10% in 2012). Analyses based on administrative data from Statistics Netherlands shows that in the period 2006–2012 around 40–45% of the temporary workers have moved to a permanent position (potentially at another employer) within three years. About one out of three workers who accept a job with a temporary contract stays in a temporary position for longer than three years – some of these workers move from one temporary job to another.

[1] If we take into account regulations for collective dismissals in addition to individual dismissals, the Netherlands still ranks third. However, in that case the German system appears to be stricter than the Dutch.

[2] For more details on the Dutch EPL system, see Deelen et al. (2006) and OECD (2012, 2013a,b).

[3] In 2012, the average severance payment was about €35.000 (Hoevenagel and Engelen, 2013).

[4] The figures discussed in this paragraph are based on a recent report by Heyma and Werff (2013).

The emergence of a dual labor market, where a large number of temporary workers may be trapped in precarious careers, is a major concern for the Dutch government. The government therefore implemented the Work and Security Act ('Wet Werk en Zekerheid'): the act was adopted by the senate in 2014 and will become effective in 2015. One of the central aims of the reform is to improve the position of temporary workers by encouraging faster conversion from temporary to permanent contracts. The new law entails an extensive reform of the employment protection system, including a unification of the rules for severance pay for the two dismissal routes, an introduction of an upper limit for severance pay and a shortening of the maximum cumulative duration of fixed-term contracts from 36 to 24 months.

For the purpose of our study, the strict division in the protection of temporary and permanent employees and the large proportion of temporary employees make the Netherlands an interesting case to investigate the effects of contract types on training.

3. Theoretical framework

The study of firm investment in training has a long history in the economic literature. Traditional human capital models distinguish between firm-specific and general training (Becker, 1962). In Becker's formulation, firms only pay for firm-specific training since this type of training improves productivity in the current job but not in outside jobs. The firm can pay a post-training wage below the worker's productivity level and therefore has an incentive to invest in firm-specific training. However, in a labor market with perfect information and competition, general training will not be financed by the firm. Because general training improves the worker's skills relevant in all jobs and therefore increases his market wage, the firm has to pay the worker a wage equal to his productivity level and is unable to recoup the investment.

Later contributions by Acemoglu and Pischke (1999, 2001) as well as much of the recent theoretical literature on training (e.g. Leuven, 2005) demonstrate that general training may also be financed by firms if there are frictions in the labor market. In imperfect labor markets, the marginal product of employees may exceed their wages. This gap between wages and productivity generates a surplus that can be captured (partially) by the employer which provides employers an incentive to pay not only for firms-specific but also for general training.

Whether and how much the firm invests in training is determined by the rate of return, which depends on the training costs, the gap between wages and productivity and the expected payback period (i.e. the investment horizon). The latter element is central in this study. The payback period can be defined as the expected time the worker will stay within the firm after receiving training. Temporary workers are more likely to leave the organization for several reasons. First, in case the worker is unproductive, the firm can terminate the employment relation with a temporary employee without incurring (large) costs of dismissal. However, if the worker holds a permanent contract, the firm may prefer to retain the unproductive worker to avoid paying firing costs. This is consistent with both theoretical models and empirical evidence on employment protection indicating that labor turnover declines with employment protection (Koeniger and Prat, 2007; Micco and Pagés, 2006). Second, when labor demand drops, employers respond by adjusting the more flexible portion of their labor force, i.e. employees on temporary contracts (Pierre and Scarpetta, 2013). Scholars have argued that the sharp increase in unemployment in Spain during the Great Recession can to a large extent be attributed to the high share of temporary workers (Bentolila et al., 2012). Given that future labor demand is uncertain, firms expect the payback period of temporary workers to be shorter. Finally, the type of contract may not only affect the firing decision of the employer, but also the quit decision of the worker. Because permanent workers are likely to lose their protected position if they move to another job, they face higher costs of quitting. Moreover, a lack of job protection may also cause lower job satisfaction among temporary employees, leading to higher quit rates. Evidence points out that employment protection decreases quits (Gielen and Tatsiramos, 2012).

Turnover among temporary workers is higher than among permanent workers and thus the expected payback period is shorter for the former group. This implies a negative relationship between temporary contracts and training.

Hypothesis 1. Temporary employees are less likely to receive firm-sponsored training than permanent employees.

Hypothesis 1 has been confirmed empirically across a number of European labor markets. In an early study based on the British Household Panel Survey, Arulampalam and Booth (1998) demonstrate that workers on temporary contracts are less likely to participate in training. Forrier and Sels (2003) show that Belgian employees with temporary contracts often pay for their own training and do not receive as much training as permanent employees. Arulampalam et al. (2004) study work-related training in 10 European countries using the European Community Household Panel and find that temporary employment lowers training chances in Austria, Britain, Denmark and Finland by around 10%. In a more recent study, Fouarge et al. (2012) demonstrate that flexible employees in the Netherlands are less likely to receive firm-sponsored training, which they only partly compensate for through their own investments in training.

Despite the large number of estimates of the direct relationship between contract type and firm investments in training, previous empirical literature has ignored the potential role that job match quality may play in determining the difference between temporary and permanent workers. The match quality of a job is defined by two related elements: the worker's productivity in the job and the value attached to non-monetary aspects of the job (e.g. Hersch and Reagan, 1995). Firms and workers may have imperfect information about each other, so workers and firms may not know ex-ante the quality of the match. When the match turns out to be poor, the productivity will be low and the employer prefers to dissolve the

match. From the employees' point of view, job mismatches imply low job satisfaction, which induces on-the-job search leading to higher quit rates (Allen and van der Velden, 2001). Hence, good job matches will yield higher productivity and tend to continue longer while jobs mismatches result in low productivity and turnover (Jovanovic, 1979).

In labor market models with permanent and temporary contracts, the quality of a job match is the critical factor for whether an employment relationship is continued or not (Cahuc and Postel-Vinay, 2002; Blanchard and Landier, 2002). These models demonstrate that relatively low quality job matches may be continued if the worker is on a permanent contract because of the associated firing costs. A rational firm will decide to retain an employee if the expected profits from continuing the match plus the firing costs are positive. Because dismissal costs for permanent workers may be substantial, the firm may decide to keep the worker even if the value of the match is negative (i.e. wages are higher than productivity). As firing costs are limited or absent for temporary workers, the minimum match quality requirement to be retained is higher for temporary than for permanent employees. While these models do not directly incorporate training decisions, it follows naturally that job matches that are likely to be continued have a longer investment horizon and will therefore lead to larger training investments. At higher levels of match quality, the expected value of the match is positive and the firm prefers to keep the worker independent of the contract type. Moreover, workers in good job matches are less likely to quit.

Because employer- and employee-initiated separations decline with the quality of the match, the difference between contracts in the investment horizon also narrows with match quality. Differences in training investments between contract types may therefore be limited for good job matches. However, if the quality of the match is low, the firm may retain the permanent but dismiss the temporary worker: in that case we expect a substantial difference in training opportunities between temporary and permanent employees.

Hypothesis 2. The negative effect of having a temporary contract on the probability of receiving firm-sponsored training declines with match quality.

In this study we test Hypotheses 1 and 2 empirically using data from the Netherlands. Since previous literature has examined the relation between contract types and participation in training activities as predicted in the first hypothesis, we focus on the second hypothesis.

4. Data and methodology

4.1. Data

To test our hypotheses empirically, we make use of the LISS (Longitudinal Internet Studies for the Social sciences) survey, a Dutch panel collected by CentERdata. The panel consists of around 5000 households and is a representative sample of households drawn from official populations registers. Panel members were recruited using more traditional approaches. Initially, a letter was sent to all households in the sample, announcing that they will be contacted by an interviewer and explaining the nature of the survey. The letter included a 10 euro note to stimulate the willingness to participate.[5] Next, the household was contacted by telephone (if a telephone number was available) or was visited by an interviewer. In total 48% of the total gross sample registered as a LISS panel member. Although LISS is an internet survey, households without internet access are provided with a special computer and internet connection.[6]

All seven currently available waves (2008–2014) are used in this study. We merge information on background variables with information from the LISS 'Work and Employment' core study. Around 75–80% of the LISS panel members completed this study.[7] This study includes questions on participation in training, the type of employment contract, indicators of match quality and various other items that we use as controls. To focus our analysis on employees' training, the analysis is limited to men who are between the ages 20 and 65 and hold a paid job of at least 12 hours (according to the contract). The main sample consists of 5779 observations (1818 individuals) and the panel is unbalanced in the final sample. The sample is restricted to men since women in the Netherlands often work part-time and have career breaks through parental leave, which is likely to affect their human capital investments.[8]

4.2. Variables

Our main dependent variable throughout the analysis is a binary variable on whether an employee reports having received firm sponsored training. Respondents are asked whether they followed a training program or educational course in the last 12 months. As we are interested in the probability that a worker will receive training in the (immediate) future,

[5] A pilot has shown that this approach was rather effective to increase participation.

[6] For more details on recruitment and sampling, see www.lissdata.nl and Scherpenzeel (2009).

[7] The response rate is rather high because panel members receive a payment for completing a survey. Moreover, after the initial data collection round (in April), the non-participating members could complete the survey in the second round (in May). In both rounds, non-responding panel members received two reminders.

[8] We tested the main models for female workers as well. The effects are similar in some but not all cases. Overall, the results are less consistent for female employees: even the impact of holding a temporary contract is not significant in all specifications. A potential explanation is that working hours may be more important than contract types for training probabilities of women.

we use information on training participation from the next wave. The respondent also specifies who paid for the training: the individual, the respondents' parents, the employer or both the respondent and the employer. The respondent could give details for up to three training programs or courses. For the analysis, we construct a firm-sponsored training dummy which is equal to 1 if the worker participated in at least one training program that is fully paid by the employer.[9] As shown in Table 1, firm-sponsored training is fairly common among the sample, with more than 30% of employees reporting that they participated in at least one training program that was financed by their employer.

For testing both Hypotheses 1 and 2, the effect of the contract type is central. A binary variable indicating whether a respondent has a temporary contract is constructed. The large majority of the temporary workers in the sample has a fixed-term contract ($N = 311$). There is a small number of temporary agency workers ($N = 78$) that we also classify as temporary employees. As Table 1 shows, the share of employees on temporary contracts in our sample is smaller than the national average. However, the complete LISS survey has a proportion of temporary workers equal to 18% which is similar to the national average. The difference is caused by our sample excluding women, individuals below the age of 20 and workers on small part-time jobs. These excluded workers are more likely to be on temporary contracts.[10]

The quality of the job match is hard to quantify. Assuming that "good matches last", a large number of studies use tenure to proxy for match quality (e.g. Caliendo et al., 2013; Centeno, 2004). As the cumulative duration of temporary contracts is in general limited to three years (see Section 2), workers with long tenure are de facto permanent workers. Given that tenure is highly related to the type of employment contract, this indicator may be inappropriate for this particular study.[11] For that reason we follow several studies (e.g. Clark, 2001; Ferreira and Taylor, 2011; Gielen and Tatsiramos, 2012) that measure the quality of the job match using information on job satisfaction. The intuitive basis of using job satisfaction as a measure for match quality can be traced back to Freeman (1978), who makes the argument that job satisfaction reduces disutility of work and improves productivity. Recent work by Böckerman and Ilmakunnas (2012) shows that job satisfaction is negatively associated with quit rates and positively affects establishment-level productivity. Job satisfaction is positively related to organizational citizenship behavior and negatively to shirking and absenteeism (see Judge et al. (2001) or Wright and Cropanzano (2007) for surveys on the effects of job satisfaction). So, job satisfaction is related to two central elements of match quality, i.e. the worker's valuation of non-monetary job characteristics and firm productivity.

The LISS includes five questions that directly relate to the satisfaction with the current job, which are answered on a 0–10 scale with 10 indicating the highest level of satisfaction (see Appendix Table A.1). We follow the approach of Ferreira and Taylor (2011), who construct an aggregate job satisfaction measure using a number of questions on how satisfied the worker is with different aspects of the job. Since not all questions may be relevant for the quality of a job match, we select items 1–3 to construct an overall job satisfaction variable.[12] The average interitem correlation of these three questions is 0.58 and the Cronbach reliability measure is 0.79, reflecting internal consistency of the different items. We perform a factor analysis, estimating the model by maximum likelihood (see Appendix Table A.2 for details). The resulting first factor is estimated and the scores are used as an indicator for match quality. The summary statistics for the generated variable are shown in Table 1.

We test the quality of our job satisfaction variable as an indicator of match quality by checking its correlation with other factors associated with match quality: months of tenure, employment with the same employer in the subsequent panel wave and subjective job insecurity.[13] Subjective job insecurity is measured using a question about how likely the respondent's current job is to disappear within the next year (which was answered on a 4-point scale). Table 2 confirms that the correlations between the constructed match quality indicator and these other variables are significant and have the expected sign. The correlation between job satisfaction and tenure is rather low, which can be expected as the relation between the two variables seems non-linear.[14]

Training participation, contract type and match quality are the three variables that are central in our analysis. As a first test of our hypotheses, we examine the relation between these variables without using any controls. Fig. 1A and B respectively present a linear and non-parametric prediction of training probabilities for temporary and permanent employees for different levels of match quality. The figures support both Hypotheses 1 and 2. On average, there is a clear difference between training probabilities of permanent and temporary employees because the lines predicting the training probability of temporary employees are consistently below the lines for permanent employees. As predicted in Hypothesis 2, this training gap diminishes with match quality.

Beyond the three main variables of the empirical analysis (i.e. training participation, contract type and match quality), we use a large number of control variables in the regression analysis. These include individual characteristics such as age,

[9] The small number of individuals who responded that the costs were covered jointly by employees and employers are left out of the analysis. Sensitivity checks of including these observations in the employer provided training category shows that the regression results do not change significantly.

[10] Furthermore, a concern may be that attrition is higher among temporary workers. It appears indeed that attrition is higher among workers in temporary employment. However, this relation is driven by age (attrition is higher among younger respondents).

[11] However, we test the robustness of the results using tenure as an indicator of match quality (see Section 5.4).

[12] For robustness tests we used two alternative match quality variables based on the job satisfaction items (Section 5.4).

[13] As an additional test, we fitted a random effects probit model where being employed by the same employer next year is the dependent variable and job satisfaction is one of the independent variable. The control variables used in the main regressions were also included in the regression. The results show that job satisfaction is significantly positively related to the probability of being employed by the same employer in the following year, indicating that job satisfaction is a good measure of the quality of the job match in the LISS dataset.

[14] Ferreira and Taylor (2011) show that job satisfaction decreases during the first five years of tenure, but increases thereafter. We find a similar pattern based on the LISS data.

Table 1
Summary statistics.

	Total ($N = 5779$)	Permanent contracts ($N = 5390$)	Temporary contracts ($N = 389$)
Training incidence (%)			
Employer paid training	31.01	31.37	25.96
Constructed job satisfaction			
Mean	0	0.019	−0.211
Standard deviation	0.984	0.965	1.200
10th percentile	−1.004	−0.977	−1.627
25th percentile	−0.293	−0.293	−0.832
50th percentile	0.346	0.357	−0.221
75th percentile	0.418	0.430	0.396
90th percentile	1.053	1.053	1.064

Table 2
Match quality measures.

	Job Satisfaction	Tenure	Same employer
Tenure	0.058***	–	
Same employer	0.087***	0.177***	–
Job insecurity	−0.242***	0.027*	−0.066***

* $p < .05$.
** $p < .01$.
*** $p < .001$.

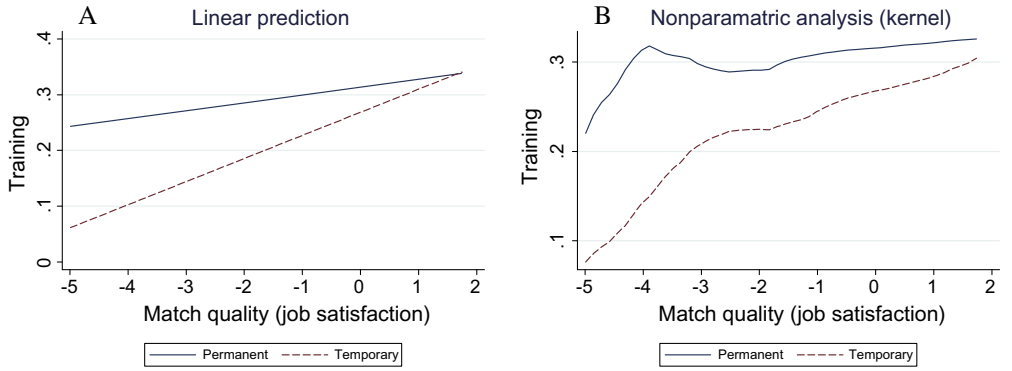

Fig. 1. Training participation of permanent and temporary workers by match quality levels. *Note:* The non-parametric analysis is based on a local-mean smoothing with a bandwidth of 1, using an epanechnikov kernel.

education, number of children and the presence of a partner in the household. In addition, we control for job and firm characteristics by including dummies for public sector, industries (10 categories), type of occupation (7 categories) and firm size (6 categories). The full list of control variables and categories can be found in Appendix B.

4.3. Estimation methodology

The empirical analysis that follows aims to estimate the effects of having a temporary contract and job satisfaction on training as well as the interaction effect between having a temporary contract and job satisfaction. Previous studies on the determinants of training that relied on (repeated) cross-section data estimated the effects using logit (e.g. Cutuli and Guetto, 2013) or probit (e.g. O'Connell and Bryne, 2012) models. Since we use longitudinal data, we apply panel data techniques to estimate the effects: following the previous literature on the effect of temporary contracts on training probabilities, we estimate a random effects probit model (Arulampalam et al., 2004). This results in a more efficient estimator than a pooled probit model due to the time invariant portion of the error term, α_i, and the correlation over time between observations from the same individual being taken into account. A potential problem is that job satisfaction is likely to be improved when the worker receives firm-sponsored training. However, the reverse causality bias may be limited as we estimate the effects on training probability within the next 12 months rather than the previous period. The estimated random effects probit model is given by:

$$Pr(\tau_{it} = 1 | X_{it}, c_{it}, s_{it}) = \Phi(\gamma c_{it} + \delta s_{it} + \pi c_{it} s_{it} + X'_{it}\beta + \alpha_i) \quad (1)$$

where X_{it} is a vector of individual characteristics that may affect training probabilities, τ_{it} indicates whether the worker receives firm-sponsored training in the next 12 months, c_{it} specifies the contract type and s_{it} indicates job satisfaction. According to Hypothesis 1, the effect of having a temporary contract (γ) will be negative while Hypothesis 2 predicts that the interaction between having a temporary contract and job satisfaction (π) will have a positive effect. To test the hypotheses, we estimate the marginal effects of having a temporary contracts on the training probability, allowing for the interaction between the type of contract and the quality of the job match. The marginal effects are calculated at different points of the match quality distribution (using a continuous match quality indicator) or for a low versus high match quality level.

Random effects models assume that the unobserved time-invariant effects are independent of the contract type and job satisfaction. We use conditional (fixed effects) logit and fixed effects linear probability models to account for unobserved heterogeneity and test the robustness of the random effects results (Section 5.2). Fixed effect models relax the independence assumption, but the within-individual variation in training and contract type is small: around 37% (6%) of the respondents change their training (contract) status throughout the panel. Most of the within-variation in contract types is driven by temporary workers moving to a permanent position: about 30% of employees with a temporary contract receive a permanent contract next year, whereas permanent employees rarely (around 1%) move into temporary contracts. Hence, the results of the FE models are based on a rather small fraction of observations.

5. Results

5.1. Main findings

Table 3 provides the estimated average marginal effects of having a temporary contract and match quality in three random effects probit models. All models include the full set of controls (see Appendix B). The models differ in the definition of the match quality variable. In the base model, the continuous form of the constructed match quality variable is used. However, the interaction between holding a temporary contract and match quality may be non-linear since above a certain threshold level of match quality the firm is likely to retain and thus train the employee regardless of the contract type. To test for non-linearity of the effects, the second and third models change the form of the match quality variable. In the second model, a binary variable is introduced instead which equals to 1 for employees above the median match quality score and 0 otherwise. The final model raises the cut-off point to the 75th percentile, with only 25% of the employees being defined as working in a job with high match quality.

All three models provide a base estimate of the effect of having a temporary contract on firm-sponsored training for the Netherlands. The average marginal effect of holding a temporary contract on the probability of firm training in the following year is negative and around 6%. The sign and size of the effect are consistent with both Hypothesis 1 and previous literature on training and temporary contracts (Arulampalam et al., 2004; Green, 1993).

To demonstrate the role of match quality in determining the effect of temporary contracts, Fig. 2 plots the average marginal effect of holding a temporary contract (compared to permanent contract) on firm-sponsored training at different values of the continuous match quality variable, allowing for the interaction between the contract type and match quality.[15] The figure confirms Hypothesis 2. While the probability of firm-sponsored training for temporary employees in a mismatch is relatively low, the negative effects diminish with the quality of the job match and are not statistically different from zero at higher levels of match quality. For match quality values above 0.3 (i.e. around the median value), the marginal effect of having a temporary contract becomes insignificant at the 5% level. For match quality values above the 75 percentile, the negative effect turns insignificant at the 10% level. This suggests that the match quality threshold level is between the second and third quartile.

In models 2 and 3, the same model is estimated using a binary instead of a continuous variable for match quality. The marginal effect of holding a temporary contract is calculated at low and high quality job matches, again allowing for the interaction between the contract type and the dummy indicating the quality of the match. Whether the cut-off point is set at the median (model 2) or at the third quartile (model 3), it is clear that there are large differences in the estimated effects for employees in poor versus good job matches. In both models, the marginal effect of having a temporary contract is significantly negative for employees with low and insignificant for employees with high match quality. For temporary employees in a mismatch, the effect size is especially large: the estimated negative effect is approximately 10% in models 2 and 3. The average negative effect for holding a temporary contract seems to be entirely driven by employees in low quality job matches.

Fig. 2 shows that there may be a significant training penalty for a considerable share of temporary workers (i.e. all workers having below average job matches). However, Fig. 1B indicates that the gap in training probabilities may be especially large for the workers with match quality levels in the first 5–10 percentiles. We therefore test whether the main results are to a large extent driven by a relatively small number of workers in very bad matches. The results are hardly affected by eliminating the bottom 10% match quality values from the analysis,[16] suggesting that employers use a cut-off value when deciding about retaining and training that is substantially higher than the 10th percentile.

[15] Although the coefficient of the interaction term is insignificant, it is jointly significant with the contract variable.

[16] In this case, the size of the marginal effect of temporary workers in low quality job matches (using the 50th percentile cut-off value) becomes −0.109 ($p < 0.01$). We again find no significant effect for good matches.

Table 3
Marginal Effect (ME) of contract types and match quality on training probabilities: random effects probit models.

	Continuous match quality	Match quality (high versus low)	
		Cut-off: 50%	Cut-off: 75%
Average ME temporary contract	−0.0631*	−0.0599*	−0.0641*
	(0.0275)	(0.0275)	(0.0266)
Average ME match quality	0.0166*	0.0516***	0.0378*
	(0.00774)	(0.0149)	(0.0166)
ME temporary contract at low quality job match	N/A	−0.0934**	−0.0984***
	–	(0.0297)	(0.0271)
ME temporary contract at high quality job match	N/A	−0.0255	0.0382
	–	(0.0438)	(0.0627)
X^2	7.88*	7.70*	10.88**
# Individuals	1818	1818	1818
# Observations	5779	5779	5779

Notes: Robust standard errors are reported in parentheses. Appendix B shows the coefficients of all independent variables. The X^2 statistic refers to the joint significance of the coefficients of the temporary contract variable and the interaction term between temporary contract and match quality.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

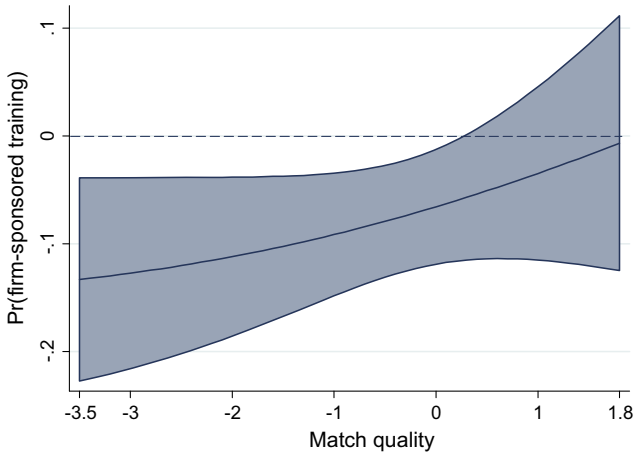

Fig. 2. Marginal effect of temporary contracts at different match quality levels. *Note:* The shaded area represents the 95% confidence interval.

The direct effects of job satisfaction are also noteworthy, as studies on how job satisfaction affects training chances are non-existent to our knowledge. While our main focus is on the interaction between match quality and temporary contracts, the job satisfaction score that we use as a proxy for match quality also has significantly positive effects on firm-sponsored training. Considering that job satisfaction is positively associated with productivity, the positive relation between job satisfaction and firm-sponsored training is not surprising.

Furthermore, several control variables are significantly related to the probability to receive firm-sponsored training. As expected, working hours seems to have a positive effect. Similarly, the coefficients of the education categories are jointly significant and there is some indication that employees with vocational degrees are mostly likely to be trained. Sector and occupation controls are also jointly highly significant. As the sector and occupation controls are correlated with individual characteristics, the effects from education and public sector employment become much larger if sector and occupation controls are omitted from the model (results available upon request). Age has a significantly negative relationship with training probability: this is in line with the results of Messe and Rouland (2014), who find that older workers were not trained more even when firing taxes were introduced in France. Tenure is not significantly related to training probability.[17]

In the remainder of this section, we provide several robustness tests of our main findings: we control for unobserved heterogeneity by using fixed effects models (5.2); we test whether the results are driven by workers moving to another employer and/or changing employment contracts between two consecutive waves (5.3); and we exploit alternative measures for the quality of the job match (5.4).

[17] Since tenure has been used as a measure of match quality, we also performed robustness tests where tenure was omitted. The main effects do not seem different in that case.

5.2. Unobserved heterogeneity

The random effects probit models do not take into account the role of unobserved heterogeneity. Although we control for a large variety of individual, job and firm characteristics, the results may be biased if unobservable factors affect the selection in the contract type. Firms may use temporary contracts as a screening device, dismissing shirking or low ability workers but retaining productive workers. Hence, employees who are less motivated or have a lower ability level may end up in temporary jobs. As firms are less likely to invest in workers with these characteristics, negative selection into temporary contracts may drive the results.

In order to test whether unobserved heterogeneity explains the results we estimated several specifications using fixed effects (FE) models. Although these models controls for unobserved heterogeneity, the drawback is that the estimates are based on only those observations that have within variation in the dependent and independent variables. Table 4 presents the results of four different specifications: conditional (FE) logit (without and with controls) models and FE linear probability models (without and with controls). All specifications include year dummies; age is therefore omitted from all fixed effects estimations. Furthermore, the education and occupation dummies are excluded from all FE models, as there is very limited within-individual variation in these variables.

The estimation results from the conditional logit and FE linear probability models are consistent with the evidence presented in the previous section: having a temporary contract decreases the probability to receive training, but this negative effect is fully driven by poor job matches. Given that the power of the test is rather weak in the fixed effects models due to the smaller number of observations driving the results, it is striking that the negative temporary contract effects are significant for workers in poor job matches (and insignificant for those in good matches). Moreover, in the conditional logit estimation (with controls) the size of the marginal effect of having a temporary contract for low quality job matches is comparable to the random effects estimates. These findings thus indicate that the relation between contract types and training investments by firms are not the result of negative selection into temporary employment.

5.3. Contract and employment dynamics

Another estimation issue may arise due to changes in the labor market position of the employee. Because we estimate the effects of having a temporary contract in t on the probability to receive employer-sponsored training in the subsequent 12 months (i.e. between t and $t+1$), the worker's position might have changed during that period. We tested to what extent this influences our results. First, workers may have moved to another employer. It can be expected that this scenario is more likely for temporary workers, particularly the ones who experience a poor job match. Hence, turnover between the two consecutive waves may affect our estimates. We therefore estimated the model with the 50 percentile match quality cut-off for a sample of non-movers (see Table 5). The average marginal effects of holding a temporary contract are insignificant, although the marginal effects for poor matches is still negative and significant ($p < 0.10$).

Second, some temporary workers may have moved to a permanent position between the two consecutive waves and may have received training after this contract change. If we select workers who still have the same contract type at $t+1$, the

Table 4
Marginal Effect (ME) of contract types and match quality on training probabilities: fixed effects models.

	Logit (FE)	Logit (FE)	LPM (FE)	LPM (FE)
Average ME temporary contract	−0.528*	−0.638*	−0.112*	−0.143**
	(0.261)	(0.279)	(0.0462)	(0.0511)
Average ME match quality	0.167	0.195	0.0223	0.0273
	(0.118)	(0.125)	(0.0180)	(0.0184)
Temporary * high quality match	–	–	0.0774	0.106+
	–	–	(0.0627)	(0.0632)
ME temporary contract at low quality job match	−0.764*	−0.916**	−0.112*	−0.143**
	(0.307)	(0.334)	(0.0462)	(0.0511)
ME temporary contract at high quality job match	−0.291	−0.360	−0.0350	−0.0374
	(0.352)	(0.362)	(0.0557)	(0.0567)
X^2 (logit)/F-test (LPM)	6.24*	7.55*	2.96+	3.95*
# Individuals	730	692	1901	1858
# Observations	3262	3068	6184	5924
Controls	No	Yes	No	Yes

Notes: Robust standard errors are reported in parentheses. The median job satisfaction score is used as the cut-off point for match quality. The X^2 statistic refers to the joint significance of the coefficients of the temporary contract variable and the interaction term between temporary contract and match quality.

+ $p < .10$.
* $p < .05$.
** $p < .01$.

Table 5
Marginal Effect (ME) of contract types and match quality on training probabilities: testing employment dynamics.

	Same employer	Same contract type	Same employer and contract
Average ME temporary contract	−0.0320	−0.0757*	−0.0206
	(0.0343)	(0.0335)	(0.0447)
Average ME match quality	0.0459**	0.0524***	0.0482**
	(0.0160)	(0.0154)	(0.0163)
ME temporary contract at low quality job match	−0.0652+	−0.109**	−0.0630
	(0.0383)	(0.0345)	(0.0484)
ME temporary contract at high quality job match	0.00111	−0.0423	0.0212
	(0.0515)	(0.0532)	(0.0677)
X^2	2.57	7.17*	1.72
# Individuals	1728	1765	1691
# Observations	5342	5529	5175

Notes: Robust standard errors are reported in parentheses. The median job satisfaction score is used as the cut-off point for match quality. The models include the same set of controls as the models presented in Table 3. The X^2 statistic refers to the joint significance of the coefficients of the temporary contract variable and the interaction term between temporary contract and match quality.

+ $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < 0.001$.

estimation results again support both hypotheses (see Table 5). However, the effect of holding a temporary contract becomes more profound. This seems to be consistent with our expectations: when the temporary employee has not been awarded a permanent contract during the next twelve months, this may indicate a relatively poor match.

Finally, we selected workers who did not move to another employer and are on the same contract at $t + 1$. In this case, the marginal effect for poor matches is negative but insignificant: however, when the 75 percentile is used, the marginal effect for poor matches is negative and significant ($p < 0.10$). For the estimations on non-movers, weaker effects can be expected as the worst matches are likely to be excluded: assuming that the poorest job matches dissolve within the next months, those who are still employed by the same firm next year are likely to be in a relatively good match and suffer a smaller training penalty.

5.4. Alternative match quality indicators

Until now we have used a match quality indicator based on three job satisfaction items. In this section, we present the results from random effects probit models using alternative match quality indicators (see Table 6). First, we create an indicator using only the general job satisfaction (item 1; Appendix A) and an indicator based on all five items (again using factor scores). The estimation results using the general job satisfaction and the job satisfaction variable using five dimensions are similar to the main results. The marginal effects from temporary contracts are significant at low but insignificant at high quality matches (using the median value as a cut-off point). Interestingly, when we use the general job satisfaction item as a continuous indicator for job match quality, the results are comparable to the estimates presented in Fig. 2: the negative marginal effects of having a temporary contract becomes insignificant ($p < 0.05$) around the median level.

Although we argue that job satisfaction is an appropriate measure of match quality, the indicator has some drawbacks as well. For instance, workers may be very satisfied with their job when they are overpaid and underworked. For that reason, we test the robustness of our results using two alternative indicators: tenure and job security. While job satisfaction has been recently employed as a measure of match quality, tenure has been used more extensively in the economic literature. Job security may capture match quality as well: the premise here is that employees in good matches feel more secure about the continuation of the employment relationship.

Using data on tenure, we define a good match as a job that lasts at least 12 months. We restrict the sample to workers with up to 6 years of tenure (including around 95% of the temporary employees), as those with longer tenure almost always have a permanent contract. Using an indicator based on tenure leads to somewhat different results: in contrast to the results from the other match quality indicators, the main effect of tenure is negative rather than positive. Training may be more common in early years of employment which may explain this negative relationship. Nevertheless, the difference in the marginal effects of temporary employment in good and bad matches remains consistent with results based on the job satisfaction items.

Perhaps the strongest support for Hypothesis 2 is found when job security is used as an indicator of match quality. In these estimations the average marginal effect of temporary employment becomes insignificant. However, the interaction term of match quality and the contract type are jointly significant. It appears that temporary workers receive significantly less training than their permanent counterparts only if their position is uncertain. This result is striking because it indicates that – in line with our theoretical predictions – uncertainty about continuation of the contract rather than the contract itself drives the negative effect of holding a temporary contract.

Table 6
Marginal Effect (ME) of contract types and match quality on training probabilities: alternative match quality indicators.

Match quality indicator	Job satisfaction[a] (general)	Job satisfaction[b] (5 items)	Tenure[c]	Job security[d]
Average ME temporary contract	−0.0634*	−0.0615*	−0.0735*	−0.0475
	(0.0270)	(0.0277)	(0.0360)	(0.0298)
Average ME match quality	0.0443**	0.0464**	−0.0611+	0.0304+
	(0.0145)	(0.0149)	(0.0324)	(0.0159)
ME temporary contract at low quality job match	−0.0907**	−0.0903**	−0.154**	−0.137***
	(0.0306)	(0.0305)	(0.0501)	(0.0300)
ME temporary contract at high quality job match	−0.0408	−0.0326	−0.0526	−0.0153
	(0.0402)	(0.0425)	(0.0416)	(0.0387)
X^2	7.36*	7.02*	9.48**	13.52**
# Individuals	1825	1813	823	1830
# Observations	5854	5752	2018	5841

Notes: Robust standard errors are reported in parentheses. The models include the same set of controls as the models presented in Table 3. The X^2 statistic refers to the joint significance of the coefficients of the temporary contract variable and the interaction term between temporary contract and match quality.

A match is defined as high quality if the worker:

[a] Reports an above the median level of general job satisfaction question (item 1, Appendix Table A.1).

[b] Reports an above the median level of job satisfaction level (based on items 1–5, Appendix Table A.1).

[c] Is currently employed by the firm for at least 12 months. The number of observations is low because the sample is restricted to workers with up to six years of tenure.

[d] A match is defined as high quality if the worker disagrees (entirely) with the statement "It is uncertain whether my job will continue to exist".

+ $p < .10$.

* $p < .05$.

** $p < .01$.

*** $p < 0.001$.

6. Discussion and conclusion

In order to increase labor market flexibility, various European countries have opted for a series of two-tier reforms that have resulted in dual labor markets with a substantial share of temporary employment. Using a recent longitudinal survey from the Netherlands, we found that temporary employees are on average less likely to receive employer funded training. These negative effects of temporary contracts on training are large and significant for mismatches, but are not found for employees who are in good job matches.

These empirical findings support our theoretical predictions and are consistent with more general matching models that allow for different contract types (e.g. Blanchard and Landier, 2002; Cahuc and Postel-Vinay, 2002). These models point out that firms will fire unproductive temporary workers but may prefer to retain unproductive permanent workers to avoid firing costs. Following these models, we argue that firing costs affect the firm's decision to train through the decision to retain. Our evidence on training investments thus provides indirect support for these matching models, as we find a strong negative effect for workers who are likely to be dismissed (the mismatches) but no effect for those who are likely to be retained (the good matches). At least in terms of training investments by the firm, the contract type makes little difference for employees in high quality job matches.

Interestingly, our main result seems to unite two conflicting perspectives found in the literature on temporary employment: a temporary job may be considered as a dead-end job, assuming the worker is trapped in unstable and precarious employment, or as a stepping stone that helps entrants to integrate into the labor market and functions as a bridge to a stable job (e.g. Amuedo-Dorantes, 2000; Booth et al., 2002; Cockx and Picchio, 2012). Our empirical findings are consistent with both perspectives. On the one hand, mismatched temporary workers are to a large extent excluded from firm-sponsored training, suggesting that they are indeed in a dead-end job. On the other hand, temporary employees who are in a good match have similar training (and presumably career) opportunities as their permanent counterparts and may therefore use the temporary contract as a stepping stone to improve their labor market position. This again points out that the quality of the job match is critical, especially for temporary employees in two-tier labor markets.

The study shows that increasing labor market flexibility through expanding temporary employment comes at a cost: temporary workers have limited access to training programs. This limits the adaptability of the flexible part of the workforce that is presumed to play a key role in economic adjustment processes. Given the problems associated with two-tier labor markets, it may not be surprising that the Dutch government implemented a reform that aims to narrow the employment protection gap between temporary and permanent workers. Whereas the Dutch reform entails a reduction of the maximum cumulative duration, other countries provide direct financial incentives to employers to stimulate the conversion from temporary to permanent contracts (e.g. a 2012 reform in Italy, see OECD (2014)). In addition, for several European countries scholars have proposed to reform the dual system and introduce a single employment contract (e.g. Blanchard and Tirole, 2004; Garcia-Perez and Osuna, 2012). An important contribution of this study to the debate on EPL reform is that the direct

trade-off between flexibility through employment protection reforms on the one hand and training investments on the other hand may be incomplete. Flexibility might have an indirect positive effects on training provisions by firms if the common assumption that flexibility improves match quality holds.

During the current great recession it has become clear that employees on temporary contracts are in a vulnerable position. The large number of job losses experienced by temporary workers explains a significant part of the rise in unemployment rates (e.g. Bentolila et al., 2012). The general implication of our study is that labor market policies should not only encourage unemployed individuals to find and accept employment, but also to stimulate the formation of good job matches. This underlines the importance of unemployment insurance as unemployment benefits may have positive effects on the quality of the post-unemployment job matches (Caliendo et al., 2013; Centeno, 2004). Investing in active labor market policies that improve job matches may be a particularly interesting policy option. Our findings highlight that even when such programs have a limited short-run impact on unemployment, they may involve substantial long-run benefits in the form of larger human capital investments when the programs improve the quality of job matches.

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Appendix A. Data description

Table A.1
Job satisfaction.

Item #	Question	Mean (s.d.)
1	How satisfied are you with your current work?	7.413 (1.493)
2	How satisfied are you with the type of work that you do?	7.601 (1.502)
3	We would first like to know how satisfied you are with your wages or salary or profit earnings	6.760 (1.829)
4	How satisfied are you with your working hours?	7.524 (1.610)
5	How satisfied are you with the general atmosphere among your colleagues?	7.585 (1.417)

Note: Responses to all questions are given on a scale from 0 to 10 with the following clarification: '0 means that you are not at all satisfied with . . . 10 means that you are fully satisfied.'

Table A.2
Factor loadings and unique variance.

	Factor loadings	Uniqueness
Pay and salary	0.494	0.756
Type of work	0.843	0.289
Overall satisfaction	0.983	0.034

Appendix B. Results: random effects probit models

Table B.1
Participation in training.

	Base model	50%	75%
Temp Work	−0.2378*	−0.3774**	−0.3820**
	(0.1057)	(0.1367)	(0.1198)
Match Quality	0.0494+	0.1572**	0.0936+
	(0.0276)	(0.0526)	(0.0562)
Temp*Match Quality	0.1201	0.2932	0.5023*
	(0.0848)	(0.1906)	(0.2200)
Age	−0.0203***	−0.0204***	−0.0204***
	(0.0036)	(0.0036)	(0.0036)

(*continued on next page*)

Table B.1 (*continued*)

	Base model	50%	75%
Urban residence	−0.0553	−0.0545	−0.0592
	(0.0637)	(0.0637)	(0.0637)
Cohabiting	0.0100	0.0104	0.0137
	(0.0802)	(0.0801)	(0.0802)
Child(ren) present	0.0248	0.0244	0.0229
	(0.0625)	(0.0624)	(0.0625)
Supervising other workers	0.0864	0.0846	0.0895
	(0.0669)	(0.0670)	(0.0669)
Tenure (months)	−0.0004	−0.0004	−0.0004
	(0.0003)	(0.0003)	(0.0003)
Public Sector	0.0556	0.0511	0.0550
	(0.1027)	(0.1026)	(0.1026)
Working hours	0.0184**	0.0188**	0.0185**
	(0.0067)	(0.0067)	(0.0068)
Education level (primary and lower secondary omitted)			
Higher secondary	0.0843	0.0948	0.0838
	(0.1356)	(0.1353)	(0.1353)
Intermediate vocational	0.1693+	0.1705+	0.1716+
	(0.0914)	(0.0913)	(0.0914)
Higher vocational	0.3369**	0.3418**	0.3415**
	(0.1050)	(0.1049)	(0.1052)
University	0.1715	0.1802	0.1734
	(0.1351)	(0.1350)	(0.1354)
Firm branch size (<50 omitted)			
Size 50–99	0.1751*	0.1738*	0.1725*
	(0.0843)	(0.0842)	(0.0843)
Size 100–199	0.1170	0.1173	0.1181
	(0.0921)	(0.0920)	(0.0922)
Size 200–499	0.1258	0.1245	0.1257
	(0.0880)	(0.0878)	(0.0881)
Size > 500	0.0691	0.0638	0.0671
	(0.0805)	(0.0805)	(0.0804)
Observations	5779	5779	5779
Number of Individuals	1818	1818	1818

Notes: The entries represent coefficients (standard errors are reported in parentheses). Estimates from the industry, occupation and year dummies and unknown firm size are omitted from the table.

Industry categories: agriculture, mining and utilities; industrial production; construction; retail trade; transport, storage and communication; finance and business; government and administration; education; health care; other.

Occupation categories: Higher academic or professional; higher supervisory position; intermediate academic or professional; intermediate supervisory or commercial position; other mental work (e.g. administrative); skilled/supervisory manual work; Unskilled and semi-skilled manual work and agrarian professions (reference category).

+ $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < 0.001$.

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