

DISCUSSION PAPER SERIES

IZA DP No. 16828

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ISSN: 2365-9793

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ABSTRACT

Refugees' Economic Integration and Firms*

We explore whether a civic integration component dedicated to labor market training (the ONA) boosts refugees' economic outcomes and the quality of firms they work for. Using linked employer-employee administrative data from 2014 to 2021 for the Netherlands and Regression Discontinuity design we find that taking the ONA sped up the economic integration of refugees for 3 years in terms of increased employment probability, hours worked and higher hourly wages. We further show that taking the ONA results in refugees working for larger, less labor-intensive and less routine-task intensive firms and experiencing increased job stability. The ONA benefits male and female refugees and particularly those from Syria.

JEL Classification: J08, J15

Keywords: refugees, firms, labor market performance, integration exam, Netherlands

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* Declarations of interest: None. Conflict of interest: None. Matt Cole and Ceren Ozgen gratefully acknowledge Birmingham Business School funding. The authors thank Francesco Fasani, Giovanni Peri, Hillel Rapoport, Zhilling Wang, the participants of the Workshop on Socio-Economic Impacts of Regional integration, Lille, 19-20 November 2021; Cambridge Land Economy Early Career Researchers' Conference, Cambridge, 9 May 2022; the workshop of the Big Data and Economics Research Network on Urban and Environmental challenges (BVRN), Birmingham, 6-7 June 2022; 5th Neuchâtel Graduate Conference on Migration and Mobility Studies, Neuchâtel, 7-8 July 2022; 61st ERSO Congress, 22-26 August 2022; DIW Workshop on the Integration of Refugee Families in Host Countries, Berlin, 29 November 2022; EALE Conference, Prague, 21-23 September 2023, as well as University of Birmingham Department of Economics seminar participants for useful comments. We also thank Dienst Uitvoering Onderwijs (DUO) for providing background information about the Dutch civic integration exams.

1 Introduction

By the end of 2022 there were 12.4 million refugees in Europe and a further 1.3 million individuals seeking asylum (UNHCR, 2022). In order to facilitate the integration of refugees several European countries have implemented integration schemes that predominantly focus on providing a greater understanding of host country cultural norms, as well as local language training. However, despite the existence of these programs, refugees' labor market outcomes continue to lag behind those of other immigrants and native workers (Fasani et al., 2022). Furthermore, our knowledge about the specific types of firms that refugees are employed by, which could itself impact the integration process, remains minimal. In response to these challenges, in 2015 the Netherlands introduced a dedicated active labor market training program specifically aimed at improving refugees' economic outcomes.

This paper quantifies the impact of this unique local labor market training program on the economic integration of recently arrived refugees. In addition, we provide new knowledge on the role played by the types of firms in which refugees are employed. In January 2015, the Netherlands introduced an additional exam component to their existing civic integration program called Orientation about the Dutch labor Market (ONA) which aims to improve immigrants' knowledge of the Dutch labor market and their readiness to find and apply for suitable jobs. This additional component goes a step beyond standard integration exams or language training and places a particular emphasis on active, practical skills such as being able to apply for jobs and to undertake a (mock) job interview in the Dutch language. The rationale behind this module is that active skills of this nature are essential to search for and secure jobs in contrast to more passive, classroom based learning such as linguistic training (Foged et al., 2022; Lochmann et al., 2019). All refugees who were granted an asylum residence permit after 1st January 2015 are required to pass the standard civic integration exam *and* the novel ONA component as part of the requirements for obtaining permanent residency in the Netherlands. Facing large numbers of asylum applications - over 45,000 in 2015 alone - and with a well-developed and unique civic integration program, the Netherlands provides an excellent setting to test

the effectiveness of such an integration requirement. This is particularly the case given that the existing European evidence on refugee integration typically stems from only a handful of countries (e.g. Denmark, Norway, and Sweden).

Our identifying variation comes from comparing the labor market performance of two groups of refugees: first, those who are obliged to complete the mandatory ONA component as part of the post-2015 civic integration exams (the treatment); and second, those who take the pre-2015 civic integration exam *without* this component (the control). We use high-frequency (monthly) linked employer-employee administrative data on the *universe* of refugees in the Netherlands for the period 2014 to 2021 and apply a Regression Discontinuity (RD) design to examine the labor market outcomes of refugees granted asylum either side of the 1st January 2015 cut-off. This empirical approach is based on the hypothesis that refugees who are close to this cut-off but fall either side of it are comparable and similar in several dimensions except for whether or not they have undertaken the ONA. To ascertain the validity of our approach we address potential concerns around the endogenous timing of refugee arrivals, bandwidth selection and heterogeneity of the underlying sample. More importantly, by linking refugees to the firms that they work for we explore whether the ONA influences the types and quality of firms in which refugees are ultimately employed. Finally, we explore the mechanisms through which the ONA may affect labor market performance.

Our analysis contributes to a growing strand of literature that focuses on the integration of refugees in host countries and documents the specific integration investments that aim to improve their labor market outcomes.¹ Specific policies that have been examined include cuts to refugee welfare benefits (Dustmann et al., 2024), restrictions on work during the period of asylum (Fasani et al., 2021), the length of the asylum process (Aslund et al., 2022; Hainmueller et al., 2016), the geographic dispersal of refugees (Martén et al., 2019; Godøy, 2017; Edin et al., 2004), cash payments to refugees (LoPalo, 2019), the provision of citizenship (Hainmueller et al., 2019), changes to permanent residency eligibility

¹It has long been established that refugees tend to face persistent and long-term disadvantages in comparison to native and other immigrant workers in terms of employment rate, income and occupational quality (Müller et al., 2022; Fasani et al., 2022; Brell et al., 2020; Kone et al., 2019)

criteria (Arendt et al., 2023), and language training (Foged et al., 2023, 2022; Lochmann et al., 2019; Auer, 2018). Of particular relevance are those that focus on active labor market policies targeted at refugees. For example, Arendt (2022) explores the impact of on-the-job training implemented in Denmark and shows a short-term positive effect on labor market participation for male refugees. Battisti et al. (2019) conduct a field experiment on approximately 400 refugees in Germany in which some are offered job-matching support. They find positive effects on employment a year after the treatment. Finally Dahlberg et al. (2024) evaluate a randomised control trial targeted at 140 low-educated refugees in Sweden and show that early and intensive training has significant positive effects on unemployment after 12 months. Key limitations of the studies in this area to date are the relatively short time horizon over which the impact of policies are assessed, the small numbers of refugees included in experimental studies, and an inability to link refugees with firm-level data. These are all limitations that our paper addresses.

Our results indicate that those who completed the ONA out-perform those who did not in terms of labor market participation, wages, and the duration of employment. Completing the ONA also significantly increased the quality of the firms that refugees worked for. This improvement is mostly a within sector compositional change towards better quality firms in service-oriented sectors and away from manufacturing firms. Crucially, taking the ONA *sped up* the economic integration of those refugees for 3 years and resulted in a sustained increase in employment probability. The divergence in employment probability between the two groups is, on average, between 3.0 and 4.3 percentage points, but peaks at approximately 15 percentage points 3.5 years after receiving their asylum permits which, on average, is the point at which refugees pass the civic integration exam. We find the ONA also raises the number of hours worked by 4.2 to 5.8 hours per month and the hourly wage by 4.4% to 5.2% resulting in an increase in earnings of up to € 1,798 per year for treated refugees. Our results also indicate that the main beneficiaries of the ONA are refugees from Syria, although both male and female refugees benefit from the training by a similar order of magnitude.

Our key departure from the previous literature is that after exploring potential mechanisms -learning, signalling, geographic mobility - behind the effect of the ONA on employment outcomes, we conclude that it operates by improving the quality of firms that refugees work for as well as the stability of that employment. More specifically, we find the ONA training makes refugees more likely to work for firms that are more productive, that have lower labor share, and that are less routine-task intensive. Refugees who complete the ONA also find a job more quickly than those in the control group and stay in employment for a longer period of time, while also being less likely to move to urban areas. These findings suggest that refugees who have completed the ONA program demonstrate a greater capacity to secure employment that is in line with their skills and capabilities. This aligns with the notion of a learning effect, whereby the program equips them with the knowledge necessary to effectively navigate the job market.

The remainder of the paper is structured as follows: Section 2 provides an overview of integration policies in the Netherlands; Section 3 outlines our data and empirical approach; Section 4 discusses our findings while Section 5 discusses mechanisms; Section 6 concludes and discusses policy implications.

2 Civic Integration in the Netherlands

In common with other European countries such as the United Kingdom, France and Germany, the Netherlands requires asylum migrants (i.e. refugees) to fulfil the requirements of a civic integration program in order to be able to reside in the country. These requirements aim to cultivate basic language proficiency and knowledge of Dutch society and to ensure that refugees are not economically or socially marginalised (Enchautegui and Giannarelli, 2015; Department of Dutch, UCL, nd). In the Netherlands asylum seekers are first admitted to refugee reception centres to wait for approval of their refugee status. Once their application is approved and they obtain an Asylum Residence Permit, they are housed across the country on a quasi-random basis and are required to pass the Dutch civic integration exam for permanent residency. Having received their asylum residence

permit they are free to work.

Since 2013, the Dutch civic integration exam consists of five components: listening; reading; writing; speaking Dutch; and knowledge of Dutch society (*Kennis van de Nederlandse Maatschappij*: KNM). Refugees can receive a social loan of up to EUR 10,000 in order to pay the costs associated with the integration program (DUO, 2022).² On passing the integration exam, individuals will receive an integration diploma and their social loan will be waived as long as the exam was completed within the three year integration period.

Individuals who fail the exam can request to extend the integration period if they have grounds to do so (e.g. if they experienced a delay due to a backlog in processing civic exams or there is a long waiting time for social housing). If Dienst Uitvoering Onderwijs (DUO)³ accept the request, refugees are given an additional integration period without penalties. If not, they will have to pay a fine of up to EUR 1,250 and will not receive a renewed temporary asylum residence permit after the initial residence permit expires (Algemene Rekenkamer, 2017).⁴ Passing the integration exam is, therefore, compulsory for all refugees over 18 years old if they wish to remain in the Netherlands.⁵

2.1 Orientation about the Dutch labor market (ONA)

In January 2015 a new component called Orientation about the Dutch labor market (*Oriëntatie op de Nederlandse Arbeidsmarkt*: ONA) was added to the existing integration requirements. This new component was publicly announced in the Official Gazette on 31 October 2014. The ONA is based on the idea that a lack of understanding of how the labor market works in the Netherlands and a lack of proficiency in how to undertake a job interview in the Dutch language makes it difficult for foreign-born workers to find suitable jobs (Broom NT2, nd). The ONA was therefore designed to deepen immi-

²The estimated cost of the integration course is EUR 7,000 (EUR 14/h x 500h). According to Fiolet Taaltrainingen (nd), the average preparation time is 500 hours. In addition, the average cost of approved integration courses for Dutch beginners in Amsterdam is EUR 13.8 per hour (Stichting Blik op Werk, nd).

³DUO is a department of the Dutch Ministry of Education

⁴Refugees are usually issued a Temporary Asylum Residence Permit which is valid for five years and which needs to be renewed if they wish to stay longer.

⁵Unless they meet exemption requirements such as providing evidence of medical difficulties or obtaining a diploma taught in Dutch.

grants' understanding of the labor market through working on a portfolio of assignments. These require participants to research the types of jobs they are interested in, to identify the qualifications or skills that are needed for these specific jobs, to learn employment-related Dutch vocabulary, how to build networks and to better understand Dutch work culture, to prepare a CV and to apply for their desired job, and to sit mock job interviews (DUO, nd).⁶ According to DUO, refugees tend to take the ONA as the last component within their integration exams, after developing some proficiency in the Dutch language. Hence, the ONA is expected to improve the labor market performance of refugees and to specifically help them find and secure a job that matches their skills and/or qualifications. As such, we may expect the ONA to improve not only the probability of refugees finding employment but also the quality of that employment as reflected in the wage rate.

The requirement to complete the ONA component came into effect in January 2015 and applies to asylum seekers who were *granted* an asylum residence permit after 1 January 2015. Refugees who obtained the residence permit before that date are exempt from the ONA component, even if they attempt the integration exam after 2015. The completion of the ONA component, therefore, depends entirely on the approval date of the asylum residence permit and is not a decision of individual refugees.⁷ This precise cut-off date due to the policy change therefore provides us with a clear identification mechanism to examine the effect of this labor market training component.

There are only small differences in the integration exam pass rate over the years, which is persistently around 95% or higher, and the duration of the integration period before and after the introduction of the ONA. The overwhelming majority of refugees fulfilled the integration exam requirement with an average duration of 31 months in the Netherlands regardless of whether they fall into pre- or post-2015 cohorts.

⁶The duration to complete the ONA varies by individual and the courses that the individual takes are typically approximately 4-5 months (DUO, nd).

⁷We later show that our results are robust to the possibility that refugees could have influenced their timing of arrival in order to avoid the ONA.

3 Empirical Methodology

3.1 Study design

To assess the impact of the ONA component on the economic integration of refugees, we compare the labor market performance of those who passed the standard civic integration exam with the new ONA component (the treated) and a control group of refugees who were required to pass the standard integration exam without the ONA. In other words, the treatment group is defined as refugees who were granted an asylum residence permit after 1st January 2015 and are thus required to pass the new integration exam with the ONA component. The control group consists of refugees who were granted an asylum residence permit in 2014, as expressed in the equation below:

$$ONA_i = 1\{x_i \geq c\} \quad (1)$$

where x_i refers to the date that individual i obtained the residence permit while c shows the cut-off date of the ONA introduction on 1st January 2015. $ONA = 1$ for the treatment group and $ONA = 0$ for the control group. We limit our sample to refugees from the 2014 and 2015 cohorts who successfully *completed* the civic integration exam, and who are of working age (i.e. 18 to 65).⁸

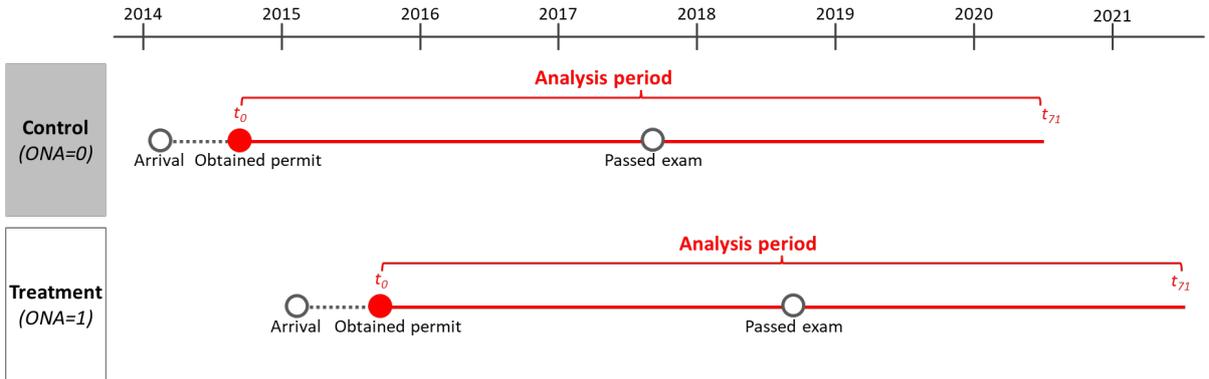
Once residence permits are issued individuals are allowed to work and be mobile without restriction and are obliged to fulfil the civic integration requirements within three years.⁹ Figure 1 outlines the study period for our analysis and illustrates the date of obtaining the asylum residence permit (t_0) and the date of passing the exam for two

⁸Although the results reported in the paper exclude those who left the Netherlands during the study period, our findings are not sensitive to their exclusion. These unreported estimations are available upon request.

⁹A key feature of the Dutch government's refugee settlement is the quasi-random allocation of refugees to social housing locations. Applicants are initially allocated to refugee centres across the Netherlands where they stay until they know whether they are granted asylum. They are then moved into social housing in municipalities. In the absence of exceptional circumstances, refugees have no say in the locations to which they are allocated and such allocations are made in proportion to the population levels of each municipality. Exceptional circumstances include the need for medical treatment or the presence of immediate family members within a particular location. However, even if these criteria are met, in practice it is often impossible for the Dutch authorities to meet refugees' needs or preferences not only due to notorious long waiting lists for social housing in the Netherlands but also due to the sudden increase in the number of refugees in the study period. Waiting times for social housing in big cities is can be as long as 9 years. (See e.g., <https://eufactcheck.eu/factcheck/mostly-true-the-netherlands-has-one-of-the-largest-social-housing-sectors-in-europe-but-the-waiting-list-for-social-housing-averages-nine-years>.) Furthermore, refusing social housing due to its location would result in a refugee remaining in the refugee centres (*AZCs*), where again they are allocated randomly. In our sample, approximately 87% of the refugees have remained in their initial assignment location without relocating throughout the study period.

hypothetical individuals. One individual arrived in 2015 and had their asylum permit approved in 2015 (and hence falls into the treatment group) and the other arrived in 2014 and had their asylum permit approved in 2014 (and hence falls into the control group). For the control group (i.e. the 2014 cohort), we have observations until 2020 while we follow the treatment group until 2021 to ensure an equivalent post-permit period of analysis.

Figure 1: Standard time frame for control and treatment groups



Note: This figure shows the integration time scale for treatment and control groups for *two hypothetical individuals*. t_0 refers to the month that individuals obtained their residence permits and thus started their integration periods. Individuals whose asylum residence permits were granted in 2014 took the old exam and constitute the control group. Those whose permits were granted in 2015 took the new exam, containing the ONA, and constitute the treatment group.

3.2 Econometric analysis

To identify the causal impact of the ONA, we estimate a regression discontinuity model as specified below.

$$Y_{it} = \alpha + \delta ONA_i + \eta(x_i - c) + \lambda ONA_i(x_i - c) + \rho Z_{it} + \epsilon_{it} \quad (2)$$

where Y_{it} refers to the labor market performance (i.e. the probability of being employed, the number of hours worked or log hourly wages) of individual i at time t (month). We consider the probability of being in employment as a proxy for labor market participation, hours worked as an indicator of employment quantity, and hourly wages as a measure of job quality.

Benefiting from our unique linked employer-employee data, we also explore the mecha-

nisms through which the ONA may influence labor market performance by replacing the employment outcome dependent variables with a number of indicators of employment stability and firm quality. More specifically: *i) Stability of jobs*: we examine whether the ONA improves refugees’ ability to find sustained employment in terms of speed to become employed (# of months to get first job), job duration (average tenure), and geographical stability in terms of locational mobility (# of moves from the initial assignment region to a more urbanised area); and *ii) Quality of firms*: we explore if the ONA increases the probability to be employed in higher quality firms by focusing on whether those who take the ONA are more likely to be employed in high-value added firms (firms with value-added larger than the national average), low labor share firms (firms with labor share lower than the national average) and less routine-task intensive firms (firms with RTI score < average RTI score of the sampled firms).¹⁰ Section 5, Mechanisms, outlines our approach to examining the potential mechanisms behind the ONA’s labor market impact in more detail.

Referring back to Equation 2, the term $x_i - c$ is our running variable representing the distance in time between the cut-off date c and the date x that individual i was granted the asylum residence permit. To account for differences between individuals’ pre-assignment characteristics, we include Z_i , a vector of control variables including age, gender, position in the household, country of origin and a dummy indicating whether or not the initial assignment location is an urban area.

The coefficient δ is the regression discontinuity estimate and shows the causal intention to treat (ITT) effect of the ONA on labor market outcomes. We estimate this specification for the whole study period and also estimate separate regressions for each quarter after the integration period began, using Weighted Least Squares with a triangular kernel to give more weight to the observations closer to the cut-off. We use the mean squared

¹⁰In our dataset, we establish the routine task intensity (RTI) index at the firm level by adhering to the established literature, drawing upon Autor and Dorn (2013) and Koster and Ozgen (2021). This index relies on the O*NET classification of occupations which is provided by the U.S. Bureau of Labor Statistics. We adapt this classification to the 4-digit International Standard Classification of Occupations (ISCO) at the individual worker level in Dutch labor Force Surveys (LFS). We first link this LFS to Firm register data (*ABR*) where we observe almost the universe of firms in the Netherlands. We then aggregate RTI scores at the firm level. Finally, by using unique firm identifiers, we merge our linked employer-employee refugee data with the firm register to obtain RTI scores for the firms in which refugees work. For more details of the adaptation of RTI from O*NET to ISCO and construction of RTI measure at the individual level, see Koster and Ozgen (2021).

error (MSE) optimal bandwidth from Calonico et al. (2019). We primarily focus on local linear and quadratic estimations as low-order polynomial approximations are known to be more robust and less sensitive to boundary and over-fitting problems. This approach can be considered formally as a non-parametric local polynomial approximation (Cattaneo et al., 2020). While the local linear estimator generally provides a good trade-off between precision, stability and simplicity, for all of our findings we also report results using local quadratic estimators for comparison. While for a given polynomial order the accuracy of the approximation can be improved by reducing the bandwidth, Appendix Figure A3 confirms that our results are not unduly sensitive to the choice of bandwidth.

It should be noted that two of our outcome variables, hours worked and hourly wage, are only observed when an individual is employed. For these estimations, expectedly, the sample size becomes smaller.¹¹ Finally, to assess whether there is heterogeneity in the impacts of the ONA, we replicate our analysis for a selection of sub-sample groups, namely refugees from Syria; those from other countries; males; and females.

3.3 Data and summary statistics

We base our analysis on two Dutch administrative datasets provided by Statistics Netherlands (CBS). Our main dataset is *Asielcohort* which contains detailed demographic and administrative information on the universe of refugees who obtained an asylum residence permit in the Netherlands since 2014. *Asielcohort* provides, for instance, information on the country of origin, gender, assignment location, education in the Netherlands, integration exam status, and numerous other variables. Crucially, *Asielcohort* provides the date the asylum residence permit was issued, allowing us to assign each individual to the treatment or control group.

¹¹Appendix Table A2 addresses possible concerns around sample selection bias within our hours worked and hourly wage estimations since only those who are employed are included within those samples. Rather than dropping all refugees who have not experienced any employment, in Appendix Table A2 we instead record such refugees as having 'zero' employment. This means the hours worked and hourly wage estimates can then utilise the full sample. As we can see, in each case the regression discontinuity is statistically significant although the magnitudes of the discontinuities increase relative to those presented in Table 3 suggesting the latter may be conservative estimates.

We link the *Asielcohort* with tax register data, *SPOLISBUS*, which provides information on labor market performance at the individual level. This dataset provides monthly data on the employment status, earnings, and hours worked for the universe of employed individuals in the Netherlands. Additionally, the dataset includes a unique job identifier for each worker in each firm, which consists of a combination of the job’s start and end dates, the firm ID, and the employee ID. This unique identifier enables the accurate tracking and analysis of individual job histories within the study period. Using the unique social security number of each individual (employee ID), we merge these two datasets for the period 2014 to 2021. Finally, for the firm level analysis, we link these two datasets to *Production Statistics*, which is a firm register and encompasses all firms in the Netherlands with more than 50 employees and a sample of firms with fewer than 50 employees. Production Statistics include detailed information on firms, for example, gross value added, wage bill, personnel costs, sector etc. The merging of these three datasets creates a linked employer-employee dataset for 8 years (monthly) containing 8,849 unique individuals and 623,717 observations, that is much larger than the comparable studies in the extant literature on labor market program evaluation.

Tables 1 and 2 present the summary statistics and balancing tests of our explanatory variables, and of our dependent variables, respectively. Table 1 indicates that the composition of our sample is predominantly male, very young, single and from Syria. Only 18% of the sample are female, 59% are between 18 – 30, while only 11% are over 40, and 47% are single.¹² The processing time of the asylum applications in the Netherlands is around 2.7 months on average which is relatively short compared to other European countries.¹³ In terms of country of origin, the two largest cohorts are from Syria and Eritrea who form 60% and 26% of the sample, respectively. The balancing tests show that all of the estimated discontinuities around the cut-off are statistically insignificant with the exception of Eritreans.¹⁴ Figure A2 presents these results graphically for a subset of variables and confirms the absence of a discontinuity at the cut-off for application months, proportion

¹²The average arrival age is 30.

¹³For information on duration of asylum procedures see <https://www.ecre.org/wp-content/uploads/2016/10/AIDA-Brief-DurationProcedures.pdf>.

¹⁴All estimations control for country of origin fixed effects. Furthermore, we show in Appendix A1 that our baseline results are almost identical when Eritrean refugees are omitted from our sample.

of female refugees, proportion of refugees in their 30s, family size, proportion of refugees from Syria and proportion of refugees living in urban areas.

Table 2 presents summary statistics for our outcome variables, for treatment and control groups, separately. We see that both groups are quite similar in terms of their characteristics. For instance, across our study period 35% of the treatment were in employment, compared to 33% of the control. Average employment tenure is 6.7 months (1.91 in logged form) for the treatment and 6.0 months for the control, and the time taken to secure the first job after passing the exam is 5.5 months for the treatment and 7.5 months for the control. The percentage of people from both groups working in high value added and in high labor share firms are similar, while a higher share of refugees in the treatment group work for less routine-task intensive firms, compared to those in the control.

Table 1: Summary statistics and balancing tests

	Mean (1)	St.Dev. (2)	RD Estimate (3)	Confidence Interval (4)
Asylum claim period	2.732	2.781	0.461	[-0.041 ; 0.963]
Female	0.184	0.388	0.054	[-0.029 ; 0.137]
Age group upon arrival				
18 – 30	0.589	0.492	0.071	[-0.016 ; 0.158]
30 – 39	0.302	0.459	-0.025	[-0.103 ; 0.054]
≥ 40	0.110	0.313	-0.046	[-0.107 ; 0.016]
Family size	1.003	0.066	0.006	[-0.002 ; 0.015]
Position in household				
Single	0.467	0.499	0.074	[-0.013 ; 0.162]
Partner/Spouse	0.097	0.297	0.024	[-0.029 ; 0.077]
Parent	0.381	0.486	-0.055	[-0.140 ; 0.031]
Child (18+)	0.042	0.201	-0.031	[-0.063 ; 0.001]
Other	0.013	0.112	-0.006	[-0.026 ; 0.015]
Country of origin				
Syria	0.603	0.489	0.035	[-0.051 ; 0.121]
Eritrea	0.257	0.437	0.091	[0.031 ; 0.152]
Iran	0.020	0.39	-0.010	[-0.030 ; 0.009]
Urban	0.474	0.499	-0.032	[-0.127 ; 0.063]
Unique # of refugees	8,839			

Note: The mean squared error (MSE) optimal bandwidth from Calonico et al. (2019) is used. RD coefficients stem from linear estimations. In line with the Statistics Netherlands' urbanisation categorisation, *Urban* is defined as a dummy = 1 when a municipality is categorised 'Very strong urban', 'Strong urban' or 'Moderate urban'.

Table 2: Summary statistics of outcome variables (whole period)

	Treatment			Control		
	Mean (1)	St.Dev. (2)	Obs. (3)	Mean (4)	St.Dev. (5)	Obs. (6)
Employment probability	0.35	0.48	327,960	0.33	0.47	293,400
Hours worked (per month)	112.27	58.77	113,799	113.07	59.55	96,519
Log(hourly wages in €)	2.55	0.26	113,799	2.51	0.25	96,519
Log(average tenure in months)	1.91	0.84	113,799	1.80	0.80	96,519
# of months to get a first job after exam	5.50	8.05	4,246	7.47	8.89	3,767
High value-added firms	0.71	0.45	39,817	0.71	0.45	35,531
High labor share firms	0.51	0.50	39,817	0.51	0.50	35,531
Less routine-task intensive firms	0.26	0.44	113,799	0.23	0.42	96,519
# of moves to an urban area	0.22	0.44	327,960	0.49	0.55	293,400

Note: All variables apart from employment probability and number of moves to an urban area are conditional on being employed. For labor share and value-added, the sample is further restricted by firms being observed in Production Statistics data. Labor share is defined as the firm's total wage bill divided by its value added.

Finally, we investigate if there is any evidence of manipulation in our running variable that would result in disproportionate numbers of asylum permits being awarded around the cut-off. Panel A of Figure A1 in the Appendix shows the raw distribution of refugees by the month that their asylum permits were granted. The figure shows no obvious pattern over time or immediately around the cut-off. Panel B provides the share of asylum applications within each month de-measured by the average monthly share of annual applications. Again, no particular pattern around the cut-off is observed. Finally, we undertake a manipulation test proposed by Cattaneo et al. (2020), in the spirit of a McCrary test, which indicates that there is no statistically significant difference in the density of asylum permits awarded around the cut-off (t-statistic of 0.80 with a P-value of 0.43).

4 Estimation Results

4.1 Baseline specifications

Table 3 reports the results of our baseline estimation of Equation (2) for the probability of being employed, hours worked and the log of hourly wages. These results stem from estimations with MSE optimal bandwidths. Employment probability is estimated using our full sample of refugees ($n = 623,717$) while hours worked and wages are conditional

upon being employed and therefore use a smaller sample ($n = 212,675$). For each dependent variable we estimate a specification using local linear estimation in column (1), local quadratic (2nd order) estimation in column (2), and a local linear estimation including control variables in column (3).¹⁵

Table 3 shows that, relative to the control group, the treatment group experienced greater employment probability, more hours worked and higher wages. More specifically, we find that over the study period, refugees who passed the ONA, on average, experienced between 3.0 and 4.3 percentage points higher probability of employment compared to those who took the pre-2015 exam without the ONA component. They also experienced an additional 4.2 to 5.8 hours of work per month and between 4.4% and 5.2% higher hourly wages.¹⁶ Our baseline results therefore indicate that treated refugees are more likely to be in employment than those in the control group and, if they are, they could earn up to € 149.9 additional per month or € 1,798 per year.¹⁷ Figure 2 provides our results graphically. For each of the three employment outcome variables we display the local linear and second order estimations either side of the cut-off. In Figure 2, we present the slopes of the linear ('Order 1') and 2nd order ('Order 2') polynomial fit and the local sample means represented by dots with confidence intervals. Each dot represents the average economic outcome over the sample period of refugees whose asylum approval date falls into the respective bins on either side of the cut-off date. Clear discontinuities at the cut-off can be observed for employment probability and hourly wages in particular.

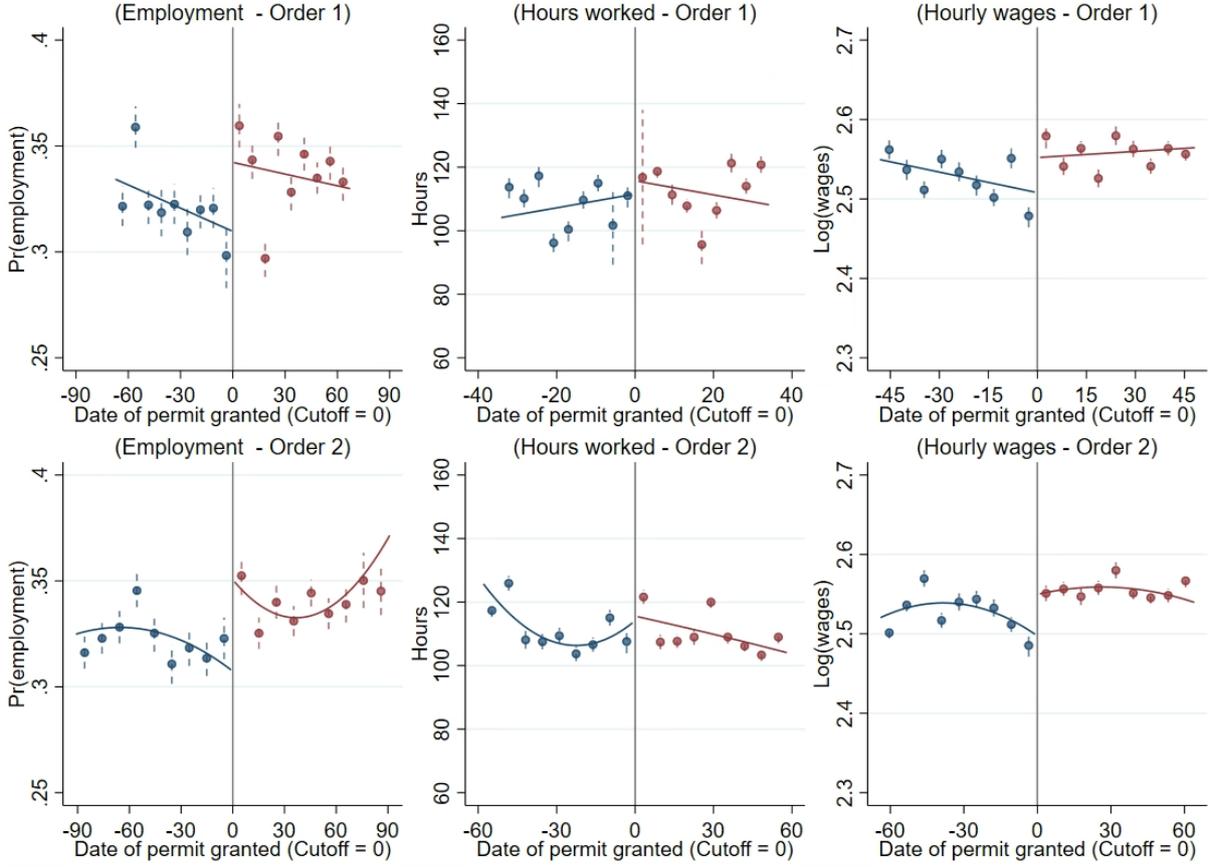
These baseline results suggest that the ONA affects not only the likelihood of participating in the labor market but also the quantity (hours worked) and the quality (hourly wages) of that employment. In other words, it seems that the ONA component successfully builds the skills required to search and apply for jobs that match the knowledge of the applicants.

¹⁵For reasons of space, for all further results we report local linear and quadratic estimations, both with controls.

¹⁶As previously mentioned, the balancing test for Eritrean refugees reveals a statistically significant discontinuity around the cut-off. Appendix Table A1 therefore re-estimates our baseline results when Eritrean refugees are excluded from the sample. The results can be seen to be very similar to those in Table 3 in terms of sign, significance and magnitude. We are therefore confident that the inclusion of Eritrean refugees is not unduly influencing our results.

¹⁷Calculated as $((112.3+5.8)*(12.55*1.052)) - (112.3*12.55) = 149.9$ where 12.55 is the sample mean level of hourly wage and 112.3 is the sample mean level of hours worked.

Figure 2: Regression Discontinuity Plots of baseline specifications



Note: The x-axis shows the difference in days between the individual permit date and the cut-off date (1 January 2015) (i.e. $x_i - c$). The lines present the local linear ('Order 1') and 2nd order ('Order 2') polynomial estimations without covariates, whilst the dots exhibit local sample averages of the outcomes within permit months. The mean squared error (MSE) optimal bandwidth from Calonico et al. (2019) is used.

4.2 Potential endogeneity relating to the timing of arrival

A potential endogeneity concern may arise if asylum seekers deliberately altered their date of arrival in the Netherlands in response to the introduction of the ONA program. For instance, less able asylum seekers may have arrived prior to January 2015 in an attempt to avoid the ONA, resulting in an upward bias in our estimation of the employment benefits of the ONA. Such a scenario seems unlikely for at least two reasons. First, studies have shown that refugees have limited knowledge of migration policies within and between countries (Robinson and Segrott, 2002; Crawley and Hagen-Zanker, 2019) and hence are unlikely to have known about the ONA in advance of arrival. Second, the cut-off date of 1st January 2015 applies to the asylum permit issue date and *not* the arrival

Table 3: RD results - Baseline

	Linear (1)	2nd Order (2)	Linear (Covariates) (3)
<i>Employment probability</i>			
RD Estimate	0.0326*** (0.00537)	0.0432*** (0.00724)	0.0304*** (0.00562)
Bandwidth	67.52	91.53	60.71
Observations	621,360	621,360	621,360
<i>Hours worked</i>			
RD Estimate	4.156*** (1.770)	1.408 (2.054)	5.841*** (1.845)
Bandwidth	34.98	58.50	31.45
Observations	210,318	210,318	210,318
<i>Log(Hourly wages)</i>			
RD Estimate	0.0442*** (0.00651)	0.0523*** (0.0065)	0.0471*** (0.00743)
Bandwidth	48.17	64.27	37.96
Observations	210,318	210,318	210,318

Note: * < 0.10, ** < 0.05, *** < 0.01 The mean squared error (MSE) optimal bandwidth from Calonico et al. (2019) is used. Column (1) provides local linear estimates without covariates, column (2) provides 2nd order estimates without covariates, while column (3) provides local linear estimates with covariates included.

date. While asylum seekers may have control over the latter they have very little, if any, control over the former. Furthermore, since the ONA was only officially announced on the 31st October 2014, by that date it was already highly likely to have been too late to avoid the ONA.¹⁸ Since the average duration of the asylum process is 2.7 months, refugees arriving in November or December 2014 would most likely have been awarded their permits in 2015 and hence would still have been subject to the ONA.

Nevertheless, we here further consider the possibility of endogenous timing. To do so, we focus on the ONA announcement date of 31st October 2014. With this in mind we restrict our sample to those who arrived in the Netherlands in the five months prior to the ONA announcement (i.e. June to October 2014) on the basis that nobody in this restricted sample would have been aware of this policy change before their arrival in the Netherlands. This restricted sample still provides treatment and control groups since it is the date on which individuals were awarded their asylum permits that determines exposure to the treatment and there was generally a gap of some months between arrival and

¹⁸The Official Gazette 2014-404, which announced the amendment of the Civic Integration Regulation regarding the addition of a practical exam on the Dutch labor market, was published on the 31st October 2014.

being awarded a permit. Hence, anyone who arrived between June and October 2014 but whose permit was awarded in January 2015 or later would form our treatment group.¹⁹ The restricted sample consists of approximately 30% of the total sample.

Table 4 provides the results of our baseline estimations using the restricted sample. For employment probability and hourly wages we again estimate positive and statistically significant regression discontinuities. More specifically, we find that the treatment group benefitted from an increase in employment probability of 10.0-12.9%, with wages increasing by 2.7-2.9%. The impact on hours worked is not statistically significant. Although the sample size is approximately one third of the baseline regression sample, these results are supportive of our full sample results by finding the ONA to increase employment probability and hourly wages.

Table 4: RD results - Restricted sample (June - Oct 2014)

	Employment probability		Hours worked		Log(hourly wages)	
	Linear (1)	2nd order (2)	Linear (3)	2nd order (4)	Linear (5)	2nd order (6)
RD Estimate	0.100*** (0.0104)	0.129*** (0.0180)	-1.257 (1.814)	-0.928 (2.916)	0.0286*** (0.00886)	0.0270*** (0.0107)
Bandwidth	28.97	28.55	38.96	42.83	36.36	59.87
Observations	192,041	192,041	62,732	62,732	62,732	62,732

Note: * < 0.10, ** < 0.05, *** < 0.01. Regression discontinuity estimates using local linear and 2nd order estimations and mean squared error (MSE) optimal bandwidth from Calonico et al. (2019). All co-variates from the baseline estimations are included.

4.3 Refugee heterogeneity

As indicated in Table 1, a large proportion of the refugees in our sample originate from Syria. The literature on the recent waves of refugees indicates that Syrian refugees are typically characterised by higher educational attainment and are more likely to suffer from health problems (Chung et al., 2018; Aksoy and Poutvaara, 2021). Since both educational attainments and health conditions heavily affect labor market outcomes, the

¹⁹Those who arrived earlier than June 2014 are very likely to fall only into the control group.

impact of the civic integration exam on the labor market performance of Syrian refugees may differ from that for refugees from other countries. We therefore explore whether our findings differ by country of origin. Specifically, we estimate our baseline specification on two sub-groups: refugees from Syria; and refugees from countries other than Syria.

The literature on refugees also highlights the limited labor market participation of female refugees in comparison to males (Bevelander, 2020). Indeed Syrians and females in our sample have labor market participation rates that are approximately 50% lower than those of other nationalities and males. According to Albrecht et al. (2021), the low labor market integration of female refugees can be explained by their limited work experience and lower educational attainment in comparison to male refugees. Therefore, we also explore heterogeneity across gender by splitting our sample into males and females.

Table 5 presents the results for employment probability to assess the heterogeneity in the effect of the ONA by country of origin and gender.²⁰ Columns (1) to (4) provide the results for Syrians and other nationalities and indicate the ONA to increase the employment probability of Syrians by 5.1 to 7.2 percentage points. In contrast, the effect of the ONA on refugees from other countries is not statistically significant. Turning to gender heterogeneity, columns (5) to (8) indicate that the ONA increases the employment probability of female refugees by 3.6 to 3.8 percentage points and that of males by 2.6 to 4.3 percentage points.

Table 5: RD results - Heterogeneity

	Syria		Other country		Male		Female	
	Linear (1)	2nd order (2)	Linear (3)	2nd order (4)	Linear (5)	2nd order (6)	Linear (7)	2nd order (8)
RD Estimate	0.0508*** (0.00757)	0.0718*** (0.0103)	-0.0153 (0.0125)	-0.0119 (0.0159)	0.0251*** (0.00557)	0.0432*** (0.00902)	0.0373*** (0.0134)	0.0357*** (0.0152)
Bandwidth	44.22	59.87	64.27	90.95	72.49	71.80	61.19	106.7
Observations	375,171	375,171	246,189	246,189	508,319	508,319	113,041	113,041

Note: * < 0.10, ** < 0.05, *** < 0.01. Regression discontinuity estimates using local linear and 2nd order estimations and mean squared error (MSE) optimal bandwidth from Calonico et al. (2019). All co-variates from the baseline estimations are included.

²⁰We focus only on employment probability due to reasons of space.

It is notable that our results indicate that both male and female refugees seem to derive significant benefits from a targetted program like the ONA. Additionally, concerning country of origin, individuals from Syria appear to be the most substantial beneficiaries of the program. These findings underscore the ONA’s potential to provide a positive step towards addressing the historical labor market challenges of these specific groups.

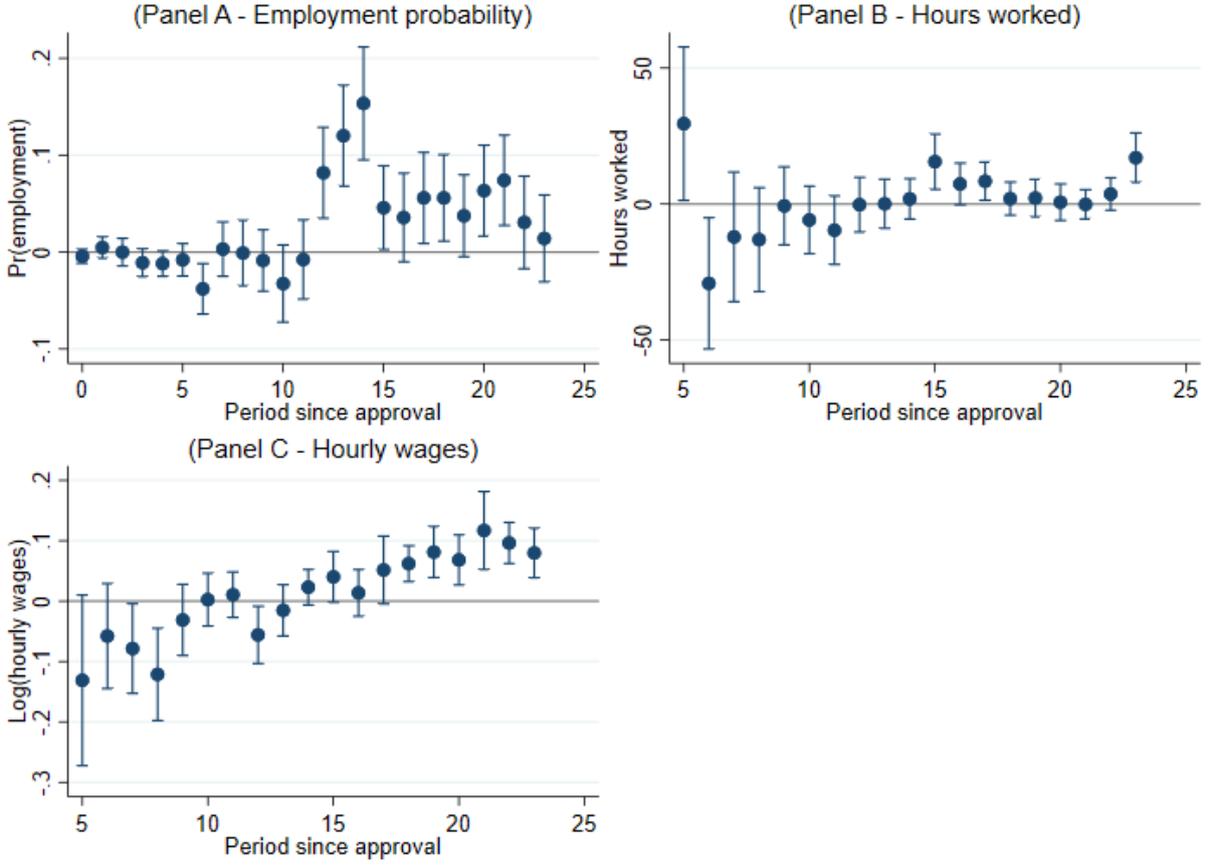
4.4 Timing of labor market impacts

As previously mentioned, the average time taken to pass the civic integration exams is approximately 31 months since the approval of the asylum residence permit for both treatment and control groups. This raises the question of at what point in time do refugees begin to experience labor market impacts from the ONA. In this section we therefore explore the timing of the ONA’s impact on labor market performance. While Table 3 provides a single regression discontinuity for each employment outcome over our period of analysis, Figure 3 illustrates the regression discontinuities that arise if we estimate Equation (2) separately for each quarter since refugees’ asylum residence permits were granted.²¹ Panel A provides the quarterly impacts of the ONA on employment probability, where we see no significant treatment effects for the first 11 quarters (33 months). This seems to be consistent with the 31 month average time to complete the civic integration exams. However, after 11 quarters, in the period when most refugees pass their ONA assessment, Panel A shows a clear and statistically significant treatment effect for the following 3 quarters. During this period employment probability rises to 15 percentage points greater than the control group before falling in magnitude but mostly remaining statistically significant.

Panels B and C of Figure 3 show the equivalent quarterly results for hours worked and hourly wages, respectively. The regression discontinuities for both variables show a positive trend over time, particularly so for hourly wages, although for hours worked the quarterly discontinuities are generally not statistically significant.

²¹Appendix Figures A1 to A5 provide quarterly results for all other estimations reported in this paper.

Figure 3: RD results - baseline



Note: These results stem from quarterly estimations of Equation 2 (local linear estimations with co-variates) with confidence intervals shown. Period since approval is measured in quarters.

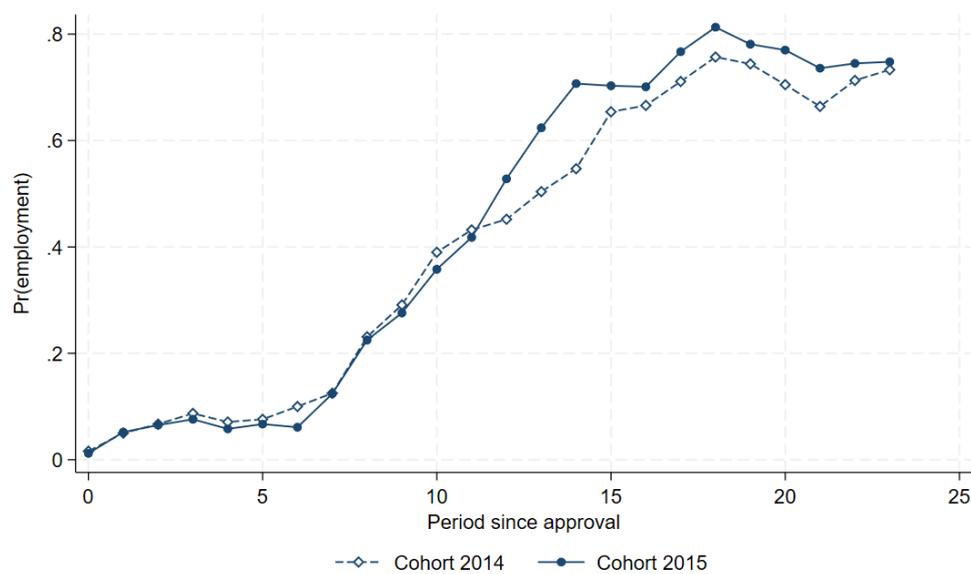
Referring back to Panel A, it is clear that the treatment group experiences a positive shift in employment probability relative to the control group shortly after passing the civic integration exam.²² However, what is not immediately clear is why relative employment probability falls from quarter 15. This could be caused by either a reduction in employment probability within the treatment group or an increase in employment probability within the control group. To investigate further we return to our baseline estimates in Table 3 and, instead of plotting the *difference* between treatment and control for each quarter (δ from Equation 2), we plot the *levels* of employment probability for the treatment and control for each quarter (α for the control and $(\alpha + \delta)$ for the treatment from Equation 2). These are shown in Figure 4 which demonstrates that starting from quarter 11, there is an increase in the employment probability for both the treatment and control

²²Appendix Figure A2 shows similar quarterly patterns in employment probability for our restricted June-October sample, while Figure A3 shows the same for Syrian, non-Syrian, male and female refugees.

groups. However, it is notable that the 2015 cohort experiences a more rapid increase. While there is a degree of convergence observed between them over time, the 2014 cohort does not fully narrow the gap with the treatment group until the very final quarter of our study period.

By providing a *sustained* increase in employment probability relative to the control group over a period of 3 years, alongside increases in hours worked and hourly wages, the ONA appears to *speed up* the process of economic integration for refugees. Given the considerable challenges faced by policymakers relating to the economic integration of refugees, the ONA seems to provide a welcome expedition of the process of labor market engagement for this vulnerable population.

Figure 4: Trajectories in employment probability by cohort and by quarter



Note: These results stem from quarterly estimations of Equation 2 (local linear estimations with co-variates) with confidence intervals shown. Period since approval is measured in quarters. The figure plots the level of employment probability for each quarter since asylum permit approval for the treatment ($(\alpha + \delta)$ from Equation 2) and the control (α from Equation 2) groups.

5 Mechanisms

If the ONA is making a notable difference to the economic integration of refugees, what are the key mechanisms through which this operates? The first and most obvious mech-

anism is if the training within the ONA genuinely improves the knowledge and abilities of refugees meaning they are better equipped for the labor market. We refer to this as a ‘learning effect’. A second mechanism could simply be a signalling effect (of better credentials). If employers *perceive* individuals who passed the ONA component to be better trained they may be more likely to employ those individuals.²³

5.1 Learning effect

If the ONA affects employment probability via the learning mechanism then this may manifest itself in two ways: First, we might observe refugees increasingly working for ‘better quality’ firms, for instance larger, higher skilled, higher productivity firms. Second, we may expect treated refugees to have greater job stability and geographical stability than those in the control group as a result of a better matching with employers. We here explore these possibilities and do so from the perspective of the firm and the worker.

5.1.1 Firm quality

In this section we take advantage of the fact that our data provides information on the firms where refugees are employed. Indeed, our linked employer-employee data allows us to explore whether passing the ONA component influences the *types* of firms that refugees are likely to work for. If, through a learning effect, the ONA increases the ability of refugees to find suitable employment that matches their skills and abilities, we may observe treated refugees being more likely to work for more productive, better managed, higher skilled firms that are typically larger in size and/or offer higher wages (Bender

²³As suggested by McKenzie and Rapoport (2010), a potential third mechanism could be a network effect. The network effect could arise if, having completed the training, individuals are better connected to Dutch citizens and fellow refugees whom they become acquainted with during the training sessions. They may then become more confident about social interactions and better informed of employment opportunities as a result of these interactions. Networks are here defined in a broader sense, consistent with Lochmann et al. (2019), and not only in terms of same-country-of-origin networks examined by Dagnelie et al. (2019). However, the introduction of the ONA component should not significantly increase the networking opportunities available to refugees. Refugees in both treatment and control groups will take the full civic integration exam, with the ONA component taken by the treatment group comprising only a small proportion of the total hours needed to meet the civic integration exam requirements. Therefore Cohort 2014 also has a similar degree of opportunity to meet and interact with Dutch citizens and peer refugees while completing the integration courses. The additional hours associated with the ONA component would therefore appear to have little impact on the difference in networking opportunities between the two groups.

et al., 2018).²⁴ We therefore explore whether refugees with the ONA are more likely to work for such firms compared to refugees in our control group.

To do so we re-estimate our baseline equation conditional on being employed, but change the dependent variable to a number of firm level variables. First, we use firm size to capture the probability of a refugee working for a large firm, where we define firm size in terms of total value added. To examine whether passing the ONA makes refugees more likely to work for firms with a low labor intensity we replace the dependent variable with labor share which is defined as the total wage bill as a share of total value added. For these variables, the median level of value added and labor share is taken as the threshold to define large firms and low labor share firms, respectively, and is calculated using data on all firms across the Dutch economy (as opposed to simply using the firms that refugees are employed in).²⁵ Finally, to test whether refugees with the ONA are more likely to work for firms undertaking more complex tasks, we calculate the routine task intensity index (RTI) of each firm based on Koster and Ozgen (2021). We define ‘less-routine’ firms as those with an RTI index below the sample mean.²⁶ As previously mentioned, Production Statistics cover all firms above 50 employees and a representative sample of smaller firms meaning our sample size for estimations using firm-level variables is inevitably smaller.

Table 6 reports our estimations of firm size, labor share and routine-task intensity. For each, we provide local linear and second order regression discontinuity estimations (with co-variates included). Columns (1) and (2) show that treated refugees are between 6.2 and 7.3 percentage points more likely to work for large firms than refugees in the control group. Since large firms are typically better managed and more productive (Bender et al., 2018), this result provides evidence that the ONA may begin to correct the traditional over-representation of refugees within low-skill, low-productivity firms. This finding is

²⁴Although the conventional wisdom is that high value-added firms tend to employ more skilled and more productive workers and pay higher wages, this relationship may not be linear, e.g. Lochner and Schulz (2021)

²⁵To explore firm heterogeneity effects further Section 5.1.4 examines differences in firms’ wage levels.

²⁶We also considered defining the routineness level of firms as $RTI < 0$ as is conventional however more than 75% of our sample work in this category of firms. We therefore consider the sample mean level of routineness to be a more informative cut-off.

supported by the results in Columns (3) and (4) for high labor share firms. Although the local linear estimation provides an insignificant regression discontinuity, the second order estimation in column (4) indicates that refugees who have successfully completed the ONA program are 7.1 percentage points less likely to work for more labor intensive firms. Finally, in columns (5) and (6) we show the results for the probability of working in a firm with a higher level of task complexity. Our results indicate that refugees who have passed the ONA are more likely to work for less routine-task intensive firms by between 2.6 and 2.9 percentage points. ²⁷

Table 6: RD results - Firm quality

	High value-added firms		High labor share firms		Less routine firms	
	Linear (1)	2nd order (2)	Linear (3)	2nd order (4)	Linear (5)	2nd order (6)
RD Estimate	0.0619*** (0.0231)	0.0734*** (0.0220)	0.0110 (0.0231)	-0.0706*** (0.0208)	0.0285*** (0.00794)	0.0257*** (0.00976)
Bandwidth	36.36	82.58	38.94	101.9	79.47	119.9
Observations	75,348	75,348	75,348	75,348	210,318	210,318

Note: * < 0.10, ** < 0.05, *** < 0.01. Regression discontinuity estimates using local linear and 2nd order estimations and mean squared error (MSE) optimal bandwidth from Calonico et al. (2019). All co-variates from the baseline estimations are included. High value-added and high labor-share firms are defined as those with value added and labor share, respectively, above the median levels in the Dutch economy. Less routine firms are those that have an RTI index that is below the sample mean.

In sum, these results paint a consistent picture of the 2015 cohort being better equipped to find employment that aligns with their skills. This results in them being more likely to work for firms that are large, have low labor share, and perform less-routine tasks.

Our Production Statistics data which provides our firm-level information also allows us to observe the 13 broad 1-digit industrial sectors in which refugees are employed. These tell us that approximately 90% of employed refugees are concentrated within 5 sectors, namely: Administrative and Support Services (34.8%) which includes temporary employment agencies, Wholesale and Retail (16.4%), Manufacturing (15.5%), Accommodation and Food Services (15.4%), and Construction (6.9%).²⁸ In each of these broad

²⁷Appendix Figure A4 shows the effect of the ONA on the probability of working for firms with these characteristics by quarter.

²⁸The full sectoral distribution of employed refugees, separately for treatment and control, is available from the authors

sectors we observe very little difference in the proportions of refugees from the treatment and control groups suggesting that the ONA does little to influence the broad sectors in which refugees are employed. We can therefore infer that the ONA’s role in increasing the probability of refugees working in higher quality firms occurs via *within* sector compositional changes and not between sector changes. Further investigation into the distribution of refugees across more detailed 2-digit sectors suggests that those who have undergone the ONA are more frequently found in service-oriented sectors, where stronger communication skills are likely essential, and less so in manufacturing.²⁹

5.1.2 Job stability - worker level

Another aspect of a learning effect may be a good match of employees to jobs in the labor market which may manifest itself in the form of greater employment stability.³⁰ To ascertain whether refugees in our treatment group benefit from greater job stability we compare employment stability between the two cohorts. Specifically, we test whether refugees in the treatment group are able to find jobs more quickly and to stay in employment for longer than the control group. We therefore replicate Equation (2) but replace the dependent variable with: i) the time taken to secure the first job after completing the civic integration exams; ii) the average tenure of jobs (where tenure in a job is the total number of months of employment in a specific job). This analysis is possible since our data allows us to observe a unique job identifier for each job-employer pair.³¹ Accordingly, our expectation is for the treatment group to experience a shorter duration of time to secure the first job and to have a longer average tenure per job.

Table 7 presents the results for these two measures of job stability. The results show that the treatment group has experienced a longer average employment tenure than the control group, with this difference being statistically significant for the 2nd order esti-

on request.

²⁹However, our ability to conduct a detailed analysis of these patterns is constrained by the limited information available on refugee occupations in our dataset. In the Netherlands the Labor Force Survey is the primary source of data on worker occupations. Since the survey covers only a sample of Dutch workers, it contains a very small proportion of the refugees in our sample.

³⁰Early studies such as Jovanovic (1979) and Bowlus (1995) motivate the link between matching quality and the length of job tenure.

³¹Average tenure and time to secure first job are conditional on being employed.

mation. The average tenure of jobs held by the treatment group is, on average, 6.6% longer than the average tenure of jobs held by the control group. In addition, passing the ONA appears to reduce the time needed by refugees to secure their first job. More specifically, after completing civic integration exams, the treatment group secured their first employment between 1.7 and 2.1 months sooner than the control group.³²

Our findings demonstrate that compared to those in the control group, refugees who complete the ONA are likely to find employment more quickly, and likely to hold those jobs for longer periods of time. Taking into consideration the entirety of our baseline results, we interpret the outcomes relating to job stability as indicative of the benefits of the ONA training. These benefits seem to materialise through improved alignment between refugees’ skills and employers’ requirements and their enhanced familiarity with the Dutch labor market.

Table 7: RD results - Job stability

	Log(average tenure)		Months until first job		Moves to an urban area	
	Linear (1)	2nd order (2)	Linear (3)	2nd order (4)	Linear (5)	2nd order (6)
RD Estimate	0.00569 (0.0160)	0.0658** (0.0265)	-1.715** (0.863)	-2.077* (1.127)	-0.149*** (0.0137)	-0.0952*** (0.0136)
Bandwidth	72.10	68.55	94.04	124.5	16.61	36.90
Observations	210,318	210,318	4,888	4,888	621,360	621,360

Note: * < 0.10, ** < 0.05, *** < 0.01. Regression discontinuity estimates using local linear and 2nd order estimations and mean squared error (MSE) optimal bandwidth from Calonico et al. (2019). All co-variates from the baseline estimations are included. Average tenure is the average duration of jobs held by refugees, months until first job is the number of months to secure the first employment after completing the civic integration exams, and moves to an urban area is defined as the number of moves made to more urbanised areas.

5.1.3 Job stability - geography

We currently know little about whether completing mandatory integration training programs provides refugees with the sorts of skills that influence the likelihood of them relocating to other, perhaps more urban, areas. The ONA could generate two competing

³²While the effect of the ONA on the time taken to secure employment cannot be shown by quarter, Appendix Figure A5 provides the quarterly effect of the ONA on average job tenure. In most cases the quarterly impacts are not statistically significant.

effects regarding the direction of mobility for refugees. On the one hand, it may incentivise refugees to relocate to more urban areas, where a greater variety of job opportunities are available for individuals with diverse skill levels. On the other hand, labor market training can also assist refugees in securing employment within their initial assignment area, thereby encouraging them to remain there.

The advantages of agglomeration economies are most pronounced in urban areas and, in the case of refugees, are likely to be compounded by the presence of co-nationals which may enhance both the willingness and capacity to economically integrate (Cole et al., 2023). Eckert et al. (2022) indeed demonstrate that refugees who resettled in Copenhagen experienced 35% faster wage growth for each additional year of experience between 1986 and 1998, surpassing the wage growth of refugees settled in other regions of Denmark. Refugees may therefore see the ONA as an additional tool to help them relocate and to search for better jobs in urban areas. In other words, obtaining the ONA can be a mechanism that mobilises refugees to denser markets resulting in an increase in their employment opportunities. Conversely, since the ONA specifically aims to enhance the labor market participation of refugees, it can contribute to the retention and adaptation of refugees within their initial assignment region. By improving their employability, refugees with the ONA can become more likely to find suitable job opportunities, integrate into the local labor market sooner and reduce the need for relocation to other areas in search of employment.

To test these arguments, we construct a variable, *mobility*, that aims to capture the geographic relocation tendency of refugees from initial assignment region in the study period. For each refugee, we count the number of location changes over the sample period since obtaining the asylum residence permit in which refugees moved from less urban to more urban areas, using the five categories of density levels that are provided in our data

³³ Hence, our dependent variable in these estimations indicates the number of realised location changes made by refugees from their initial assignment region towards more ur-

³³According to the Statistics Netherlands, urbanisation categories that are relevant to the Dutch context are defined into five population density groups: Very strong (2,500 and over/km²); Strong (1500 to 2500/km²); Moderate (1000 to 1500/km²); Weak (500 to 1000/km²); and Non-urban (less than 500/km²).

ban areas.

In Table 7 we report the ONA to be a significant determinant of the geographic mobility of refugees. We find that refugees with the ONA are statistically *less* likely to be mobile towards more urban areas with the treatment group making between 0.1 and 0.15 fewer moves to more urban areas over the period of analysis. While the magnitude of this effect may seem small, refugees in the Netherlands are generally relatively immobile. Indeed, the mean number of urban moves for the control group is 0.49, and for the treatment group is only 0.22, therefore a marginal effect of between 0.1 and 0.15 is not inconsiderable in this context. Our finding that the ONA reduces mobility to urban areas is in line with Foged and Werf (2022) who similarly find that linguistic training makes refugees less likely to move to urban areas. It is also consistent with our job stability estimations which suggest better trained refugees are likely to find employment more quickly and to stay with each employer for longer. Therefore, relocation to denser labor markets does not correlate with the increased employment probability of those who passed the ONA. This finding could have important implications for issues such as housing demand in crowded urban towns of the Netherlands, as well as the demand for transportation, schools and other public services.

5.1.4 Signalling effect

An additional mechanism that could be in operation is a signalling effect. This could arise if a training program acts as a signal to employers that those who have undertaken such training are harder working or more able in some unobserved dimension. This effect, however, assumes that individuals are able to self-select into the training program implying that higher productivity individuals will indeed opt-in while lower productivity individuals will opt-out (Lazear and Gibbs, 2014; Borjas, 2020). Where such self-selection is present, the completion of a training course or qualification allows employers to identify higher-productivity individuals. In our research setting the ONA is compulsory from the 2015 cohort onwards and hence refugees are not able to choose whether or not to partic-

ipate in it. In this setting, passing the ONA component does not reveal information on the unobservable ability of refugees and should not therefore act as a signal to employers.

Nevertheless, there may be a pure ‘sheepskin effect’ whereby individuals who possess the ONA certificate are seen as being superior by employers in some way even if in reality they are not. A pure sheepskin effect could indeed result in greater employment probability, but could result in a mismatch between worker ability and the skill-requirements of jobs, hence over-qualification, leading to shorter employment duration. As we have discussed earlier, Table 7 indicates that treated workers actually experience longer employment duration (average tenure), contrary to what we might see if a signalling effect were present.

To explore this further we argue that high-wage firms are likely to be more receptive to credentialism implying that such firms may be more inclined to employ individuals who have passed the ONA. As Orefice and Peri (2020) show, as the share of immigrants in a labor market increases, so too does the variance in the unobserved quality of workers which results in greater uncertainty to employers on the actual qualities of workers. As a consequence, it is expected that higher quality firms have stronger incentives to conduct better screening of workers because their return to a *positive match* is larger. Therefore, in an attempt to secure the highest quality individuals, high wage firms may be more influenced by potential indicators of quality such as the ONA, especially in the case of refugees. While we have already identified that those with the ONA tend to receive higher average hourly wages, we don’t yet know if this means they are more likely to work for high-wage firms. If so, then we believe this could be interpreted as evidence of a signalling effect. To test these arguments, we repeat our baseline equation conditional on being employed, but change the dependent variable to the probability of being employed in firms paying above median wages.³⁴ Table 8 reports our results and indicates that the difference between the treatment and control group is not statistically significant both for linear and 2nd order polynomial estimations. Therefore, individuals with the ONA

³⁴Changing the threshold from the median to the 75th percentile does not alter our results.

while being paid more are not necessarily more likely to be employed by high-wage firms. In sum, we do not find evidence of employers using the ONA to distinguish between job seekers, and employers do not seem to perceive the ONA to be a signal of higher ability or job performance.

Table 8: RD results - High-wage firms

	High wage	
	Linear (1)	2nd order (2)
RD Estimate	-0.00752 (0.00535)	0.00970 (0.00755)
Bandwidth	80.37	94.89
Observations	210,318	210,318

Note: * < 0.10, ** < 0.05, *** < 0.01. Regression discontinuity estimates using local linear and 2nd order estimations and mean squared error (MSE) optimal bandwidth from Calonico et al. (2019). All co-variates from the baseline estimations are included. High wage firms are defined as those with average wages above the median wage for the Dutch economy.

6 Conclusions

This paper examines the impact of the introduction of the Orientation on the Dutch labor Market (ONA) component to the Dutch civic integration exams on the economic performance of refugees in the Netherlands. Utilising this unique policy setting with a clear cut-off date, we use regression discontinuity design to compare the labor market trajectories of individuals who completed the ONA component with those who passed the old civic integration exam without the ONA.

Using linked employer-employee administrative data on the universe of refugees between 2014 and 2021, our study reveals compelling results regarding the impact of the ONA program on refugees' economic integration. Our findings show that the ONA has increased the probability of employment for refugees, on average, by 3.0 to 4.3 percentage points. When examined at a quarterly level, the effect of the ONA on employment probability increases to 15 percentage points immediately following the completion of the civic integration exam. This elevated level persists until the control group converges which oc-

curs only after approximately *three years*. A comparison of trajectories of the treatment and control groups indicates that the effect of the ONA is to raise employment probability more rapidly than the control but to also maintain a higher level of employment probability for the remaining time within our sample. In addition, those who completed the ONA benefitted from 4.2 to 5.8 more hours worked per month and hourly wages that are between 4.4% and 5.2% higher. Thus, the ONA significantly *speeds up* and increases the economic integration of refugees.

Heterogeneity analysis indicates that these benefits accrue mainly to Syrian refugees, although both males and females are beneficiaries, suggesting that policies such as the ONA could begin to correct the historically poor labor market performance of female and Syrian refugees. To put these results in context, Foged et al. (2022) find that refugees' English language training boosted Danish labor market participation by 5.6 percentage points. This comparison therefore indicates that ONA employment training increases employment participation by an effect similar in magnitude to language training alone.

We further show that the impact of the ONA on employment probability appears to stem from a genuine 'learning effect' as treated refugees work for higher quality firms and enjoy greater job stability, both suggestive of an enhanced matching of workers to firms. In terms of firm quality we show that refugees who pass the ONA are more likely to work for high value added, low labor share, less routine-task intensive firms. In terms of employment stability, relative to those in the control, refugees in the treatment group secure their first post-exam job more quickly and enjoy a longer average tenure of employment. They are also less likely to move away from the initial assignment region, again consistent with the notion that the ONA improves the skill-matching of refugees to firms. Finally, we find no evidence to suggest that refugees with the ONA are more likely to work for high-wage firms which, we argue, suggests that the ONA does not produce a signalling effect.

Our results provide a clear message for policymakers: Economic integration programs,

particularly those mandating an active demonstration of knowledge like the ONA, not only enhance refugees' labor market proficiency and job-seeking capabilities but also furnish them with essential skills for accessing higher-quality employment. These findings underscore the substantial potential of such policies to foster the economic integration of refugees. While both male and female refugees derive benefits from the ONA, the fact that refugees from Syria are the main beneficiaries suggests the need for a more targeted policy response to achieve success among refugees from other countries.

Our analysis of firm characteristics indicates that policies like the ONA can significantly shape the types of firms refugees enter. Given refugees' tendency to be associated with low-skill, high routine task-intensive, high labor-share firms (Bloch, 2002; Degler et al., 2017; Ek et al., 2023), any policy aiming to recalibrate these patterns could reduce wage disparities relative to native workers. Despite the positive impact of the ONA, refugees' average hourly wages remained below 60% of those of native workers by the end of our sample period. This indicates that persistent factors such as a lack of recognition of home-country qualifications leading to skills mismatch, a deficit in host country-specific skills and prior experience, and/or labor market discrimination continue to constrain the types of jobs held by refugees. While the ONA proves beneficial to refugees' labor market performance, it is important to emphasize that it represents only a modest stride in addressing the longstanding and deeply entrenched labor market disadvantages faced by refugees.

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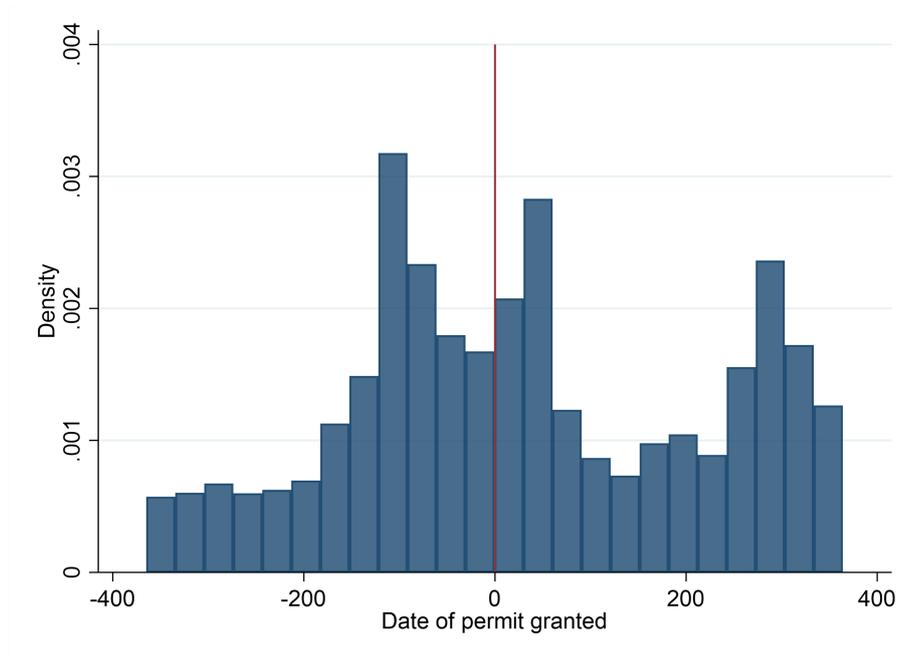
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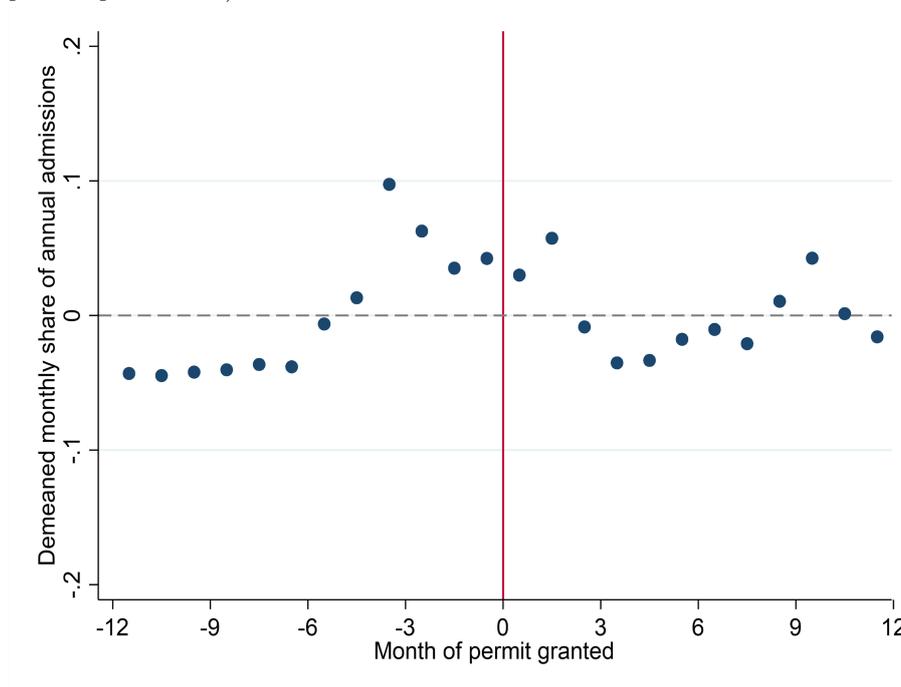
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A Appendix

Figure A1: Monthly distributions of refugees by date of asylum permit being granted, and by application date



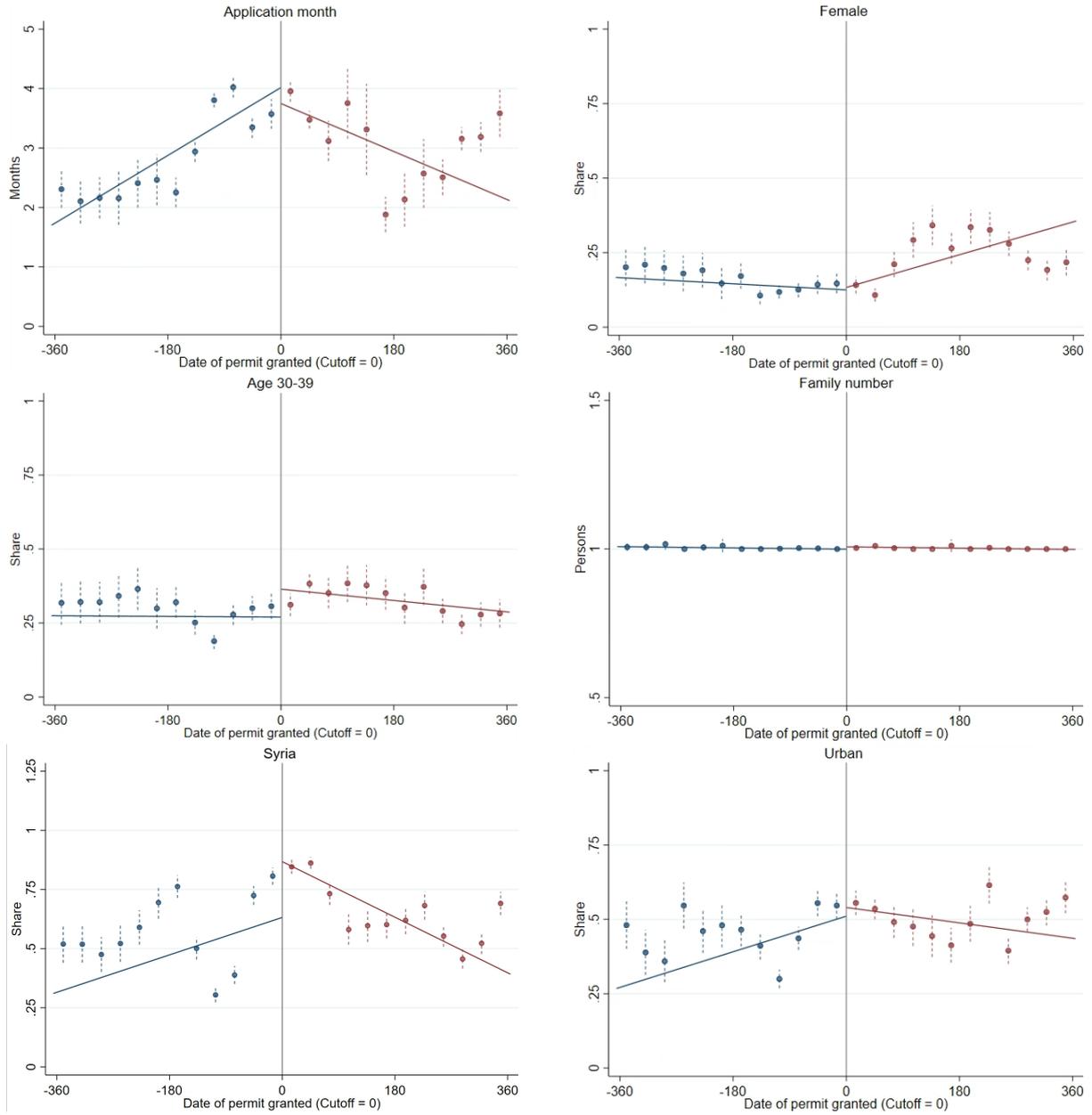
(a) Distribution of refugees by month of asylum permit being granted (for 12 months pre and post cut-off)



(b) De-measured monthly share of annual applications pre and post cut-off

Note: Panel a presents the density of refugees by month of permit being granted and Panel b shows the share of asylum applications in each month de-measured by the average monthly share of annual application number.

Figure A2: Individual characteristics by month of permit granted



Note: The x-axis shows the difference in days between the individual permit date and the cut-off date (1 January 2015) (i.e. $x_i - c$). The lines present the local linear estimations without covariates, whilst the dots exhibit local sample averages of the outcomes within bins. The mean squared error (MSE) optimal bandwidth from Calonico et al. (2019) is used.

Table A1: RD results - excluding Eritrean Refugees

	Pr(employment) (1)	Hours worked (2)	Log(hourly wages) (3)
RD Estimate	0.0315*** (0.00607)	6.154*** (1.898)	0.0498*** (0.00836)
Bandwidth	55.79	32.24	33.63
Observations	462,210	153,559	153,559

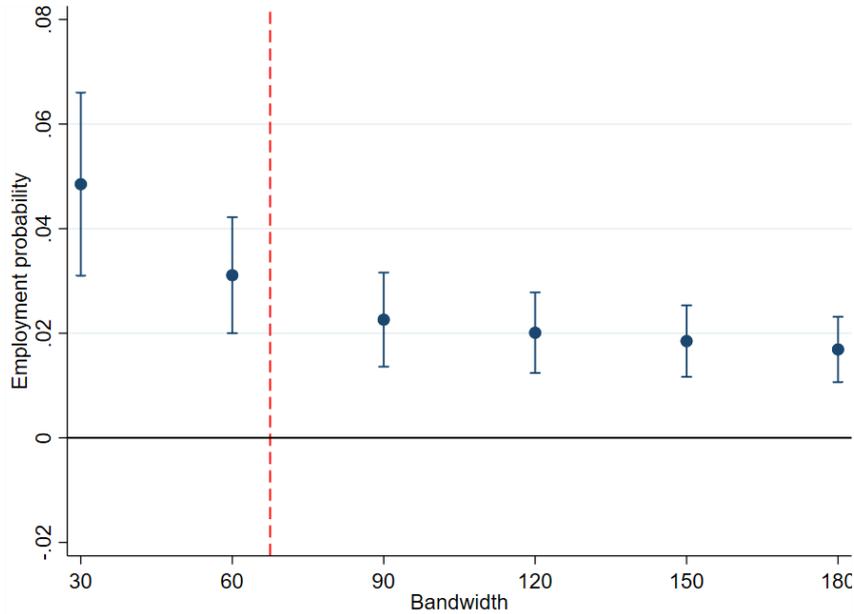
Note: * < 0.10, ** < 0.05, *** < 0.01. Regression discontinuity estimates using mean squared error (MSE) optimal bandwidth from Calonico et al. (2019). These results stem from local linear estimations with controls and should therefore be compared with those in column 3 of Table 3.

Table A2: RD results - Using full sample

	Hours worked			Log(hourly wages)		
	Linear (1)	2nd Order (2)	Covariate (3)	Linear (4)	2nd Order (5)	Covariate (6)
RD Estimate	5.883*** (0.677)	6.586*** (1.310)	6.537*** (1.119)	0.122*** (0.0182)	0.105*** (0.0182)	0.110*** (0.0173)
Bandwidth	73.97	56.40	33.10	62.56	141.6	66.33
Observations	621,360	621,360	621,360	621,360	621,360	621,360

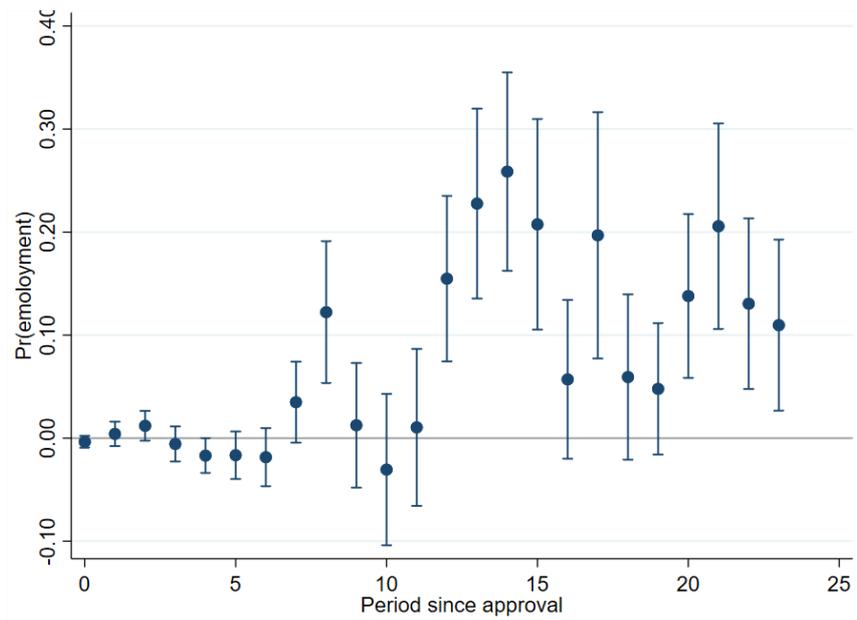
Note: * < 0.10, ** < 0.05, *** < 0.01. Regression discontinuity estimates using mean squared error (MSE) optimal bandwidth from Calonico et al. (2019). To address possible sample selection bias, in these estimations we re-classify refugees who have not experienced employment as 'zero' rather than dropping them as we do in our baseline estimations for hours worked and hourly wages.

Figure A3: Sensitivity of the impact of the ONA on employment probability to the choice of bandwidth



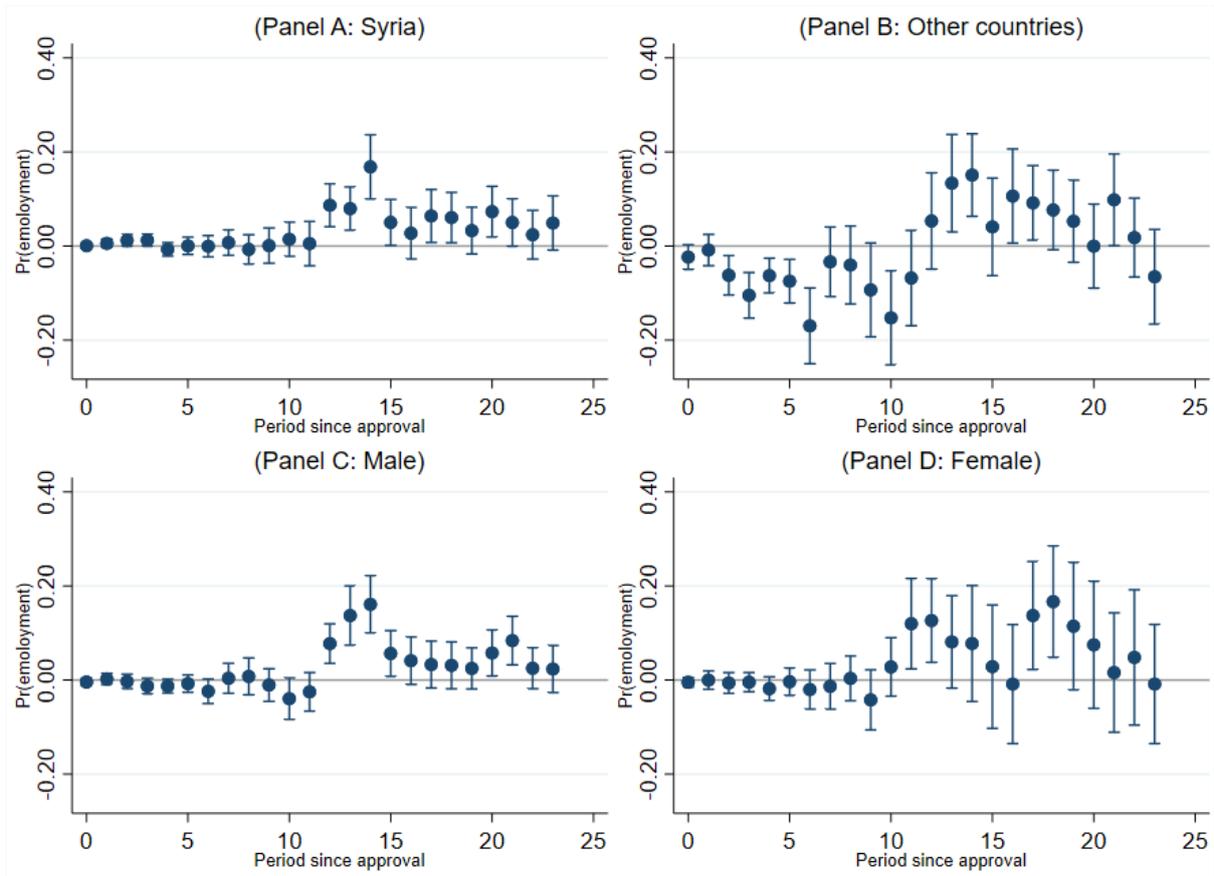
Note: Estimates of the impact of the ONA on employment probability from Equation 2 (local linear estimations with controls) using bandwidths from 30 to 180 days and showing 95% confidence intervals. The vertical dotted line represents the mean squared error optimal bandwidth of 67 days.

Figure A4: The impact of the ONA on employment probability by quarter using a restricted sample (refugees arriving June - Oct 2014)



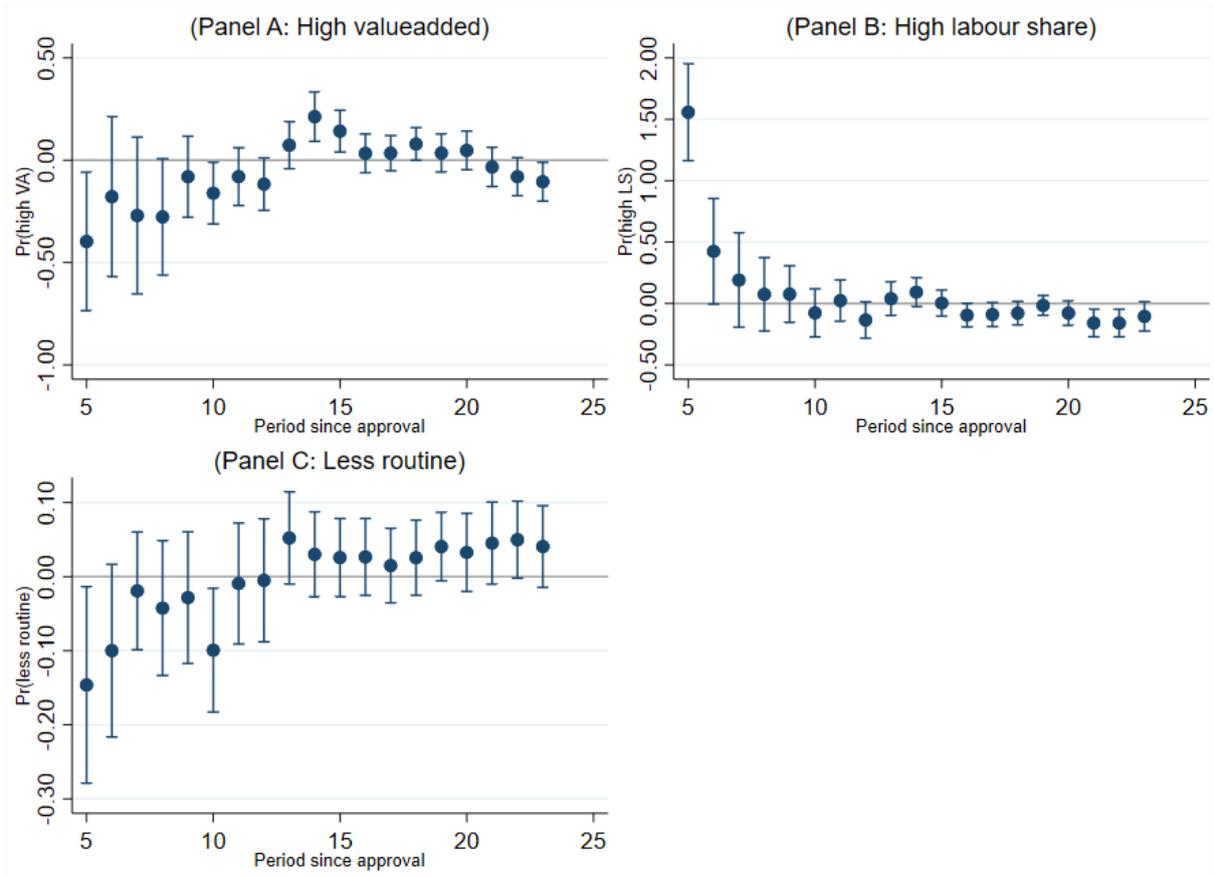
Note: These results stem from quarterly estimations of Equation 2 (local linear estimations with co-variates) with 95% confidence intervals shown. The sample is limited to those refugees who arrived between June and October 2014. Period since asylum permit approval is measured in quarters.

Figure A5: The impact of the ONA on employment probability by quarter - heterogeneity results



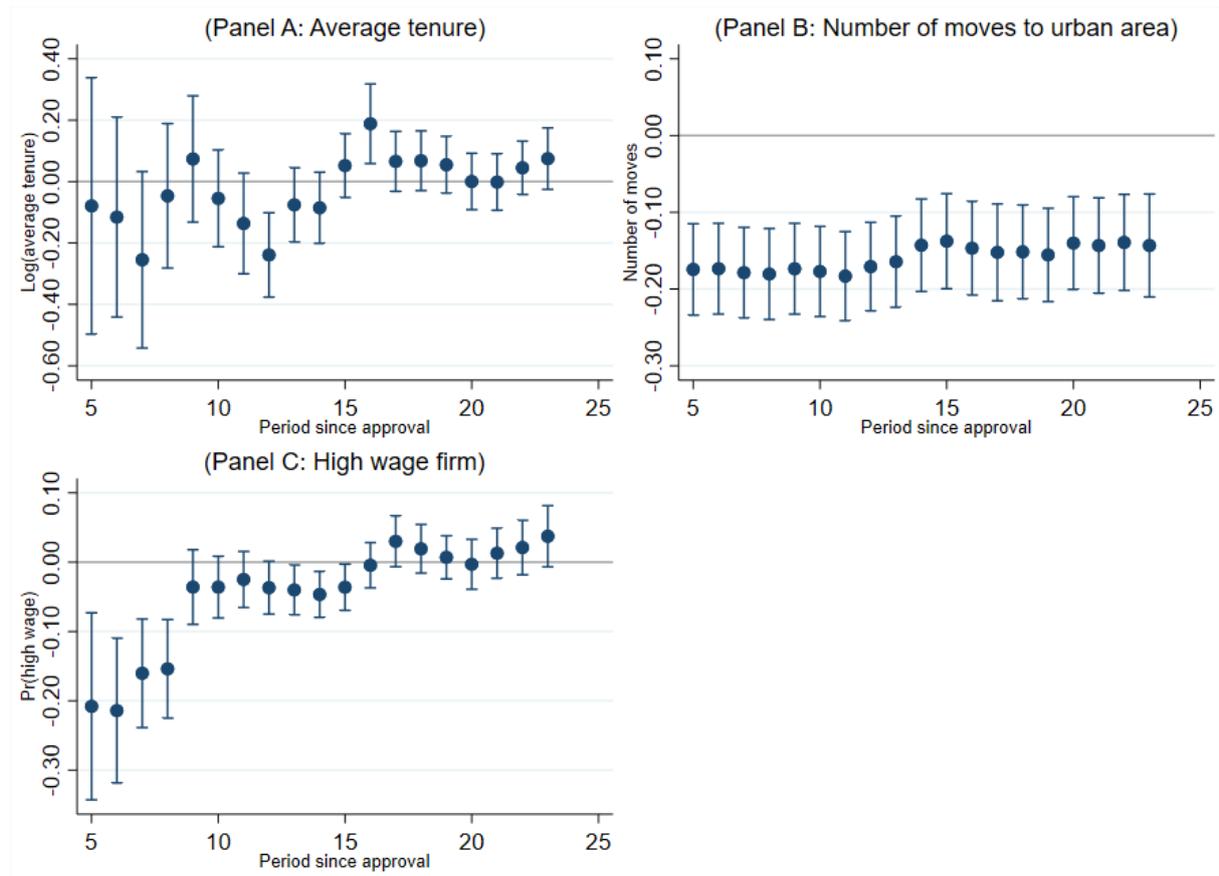
Note: These results stem from quarterly estimations of Equation 2 (local linear estimations with co-variates) with 95% confidence intervals shown. Period since asylum permit approval is measured in quarters. Panel A uses a sub-sample of Syrian refugees, Panel B uses only refugees from countries other than Syria, Panel C uses only male refugees while Panel D uses only female refugees.

Figure A6: The impact of the ONA on the probability of working in different firm types by quarter



Note: These results stem from quarterly estimations of Equation 2 (local linear estimations with co-variates) with 95% confidence intervals shown. Period since asylum permit approval is measured in quarters. In panel A the dependent variable is a dummy variable indicating if a firm has a level of value added above the median level in the Dutch economy, in Panel B it is a dummy variable indicating if a firm has a level of labor share (total wage bill / value added) above the median level in the Dutch economy, in Panel C it is a dummy variable indicating if a firm has a level of Routine Task Intensity index below the sample mean level.

Figure A7: The impact of the ONA on job stability measures and the probability of working in high wage firms by quarter



Note: These results stem from quarterly estimations of Equation 2 (local linear estimations with co-variates) with 95% confidence intervals shown. Period since asylum permit approval is measured in quarters. In panel A the dependent variable measures the average duration of employment for the jobs held by each refugee, in Panel B it is the number of moves made by each refugee to more urban areas using the 5 categories of urbanisation, in Panel C it is a dummy variable indicating if a firm has a wage level above the median level in the Dutch economy.