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ABSTRACT

Anticipation Effects of EU Accession on Immigrants' Labour Market Outcomes*

Regulations in host countries often impose heavy limitations on the opportunities of migrant workers. Here, we analyse how (the anticipation of) a change in the legal status of foreign workers may affect their terms of employment. Building on a simple theoretical model, we consider a sample of non-EU immigrants in Italy over the period which led to the accession of Romania and Bulgaria to the European Union in 2007. We find that the expectation of achieving EU citizenship increased Romanians' and Bulgarians' bargaining power over wages and job attributes, relative to other non-EU migrants, and also stimulated business venture.

JEL Classification: J28, J32, J71,J81

Keywords: migration, labor market restrictions, EU accession, workplace safety

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1 Introduction

International migrants are quite exposed to exploitation in host labor markets, as emphasized by OECD (1996) and, recently, by Barsabai et al. (2022). Labour market restrictions in destination countries, such as visa policies, as well as limited social and economic rights relative to natives (see Ruhs 2013, 2018, Blaydes 2023), tend to grant substantial power to domestic firms, lowering migrants' wages and favouring the violation of labour rights. By analyzing the 2011 liberalization of migrant workers' mobility regulations in the United Arab Emirates, Naidu et al. (2016) show that the reform implied a substantial increase in earnings, higher retention rates by current employers and more transitions to new employers.[1] They interpret these findings as evidence of reduced monopsony power of local firms.

In this paper, we ask how the accession to EU of Romania and Bulgaria changed labor market conditions for Romanian and Bulgarian migrants in Italy. The impact of accession can be associated with different factors. From the 1st of January 2007, EU membership guaranteed that Romanian and Bulgarian migrant workers in Italy were going to enjoy the same rights as those enjoyed by native citizens. Thus, EU citizenship removed the threat of repatriation if jobless, raising the bargaining power of non-native EU citizens toward domestic employers.[2] On the other hand, EU

[1] Considering racial discrimination in the European football labour market, Deschamps and De Sousa (2021) argue that the Bosman sentence greatly increased job-to-job mobility, thus reducing the ability of teams to underpay black players.

[2] To be precise, host countries maintained the option of expelling foreigners without means of support: see Sect.2. However, as shown by Mastrobuoni and Pinotti (2015), since 2007 Italian police ceased to track down Romanian and Bulgarian immigrants, thus reducing basically to zero their chance to be repatriated if found without regular employment.

citizenship allowed full mobility across EU member countries and, at the same time, it eased further the emergence of foreign entrepreneurship.[3] These circumstances increased the outside option of Romanian and Bulgarian employees.

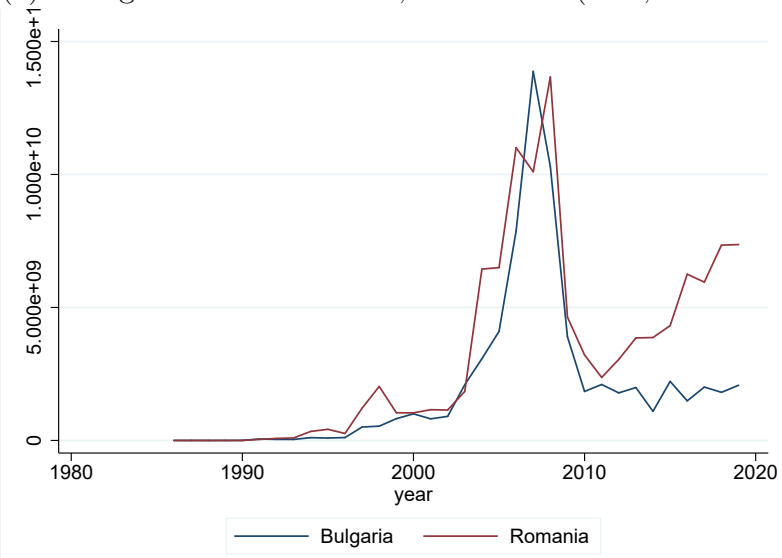
There was, however, another aspect of the (forthcoming) accession which might have had a direct impact on the labour market conditions of Romanians and Bulgarians migrants well before 2007. As shown in Figure 1 Romania and Bulgaria experienced a vigorous increase in foreign direct investment (FDI) after 2003, suggesting that international business was strongly confident about the final acceptance of such countries to the European Union. Our conjecture is that this upsurge in FDI has produced substantial consequences. Since foreign enterprises were opening new job opportunities in the country of origin, the option of repatriating became more valuable to the Romanians and the Bulgarians who were living abroad well before 2007. At the same time, the increase in FDI signalled a few years in advance that international business was confident about the success of Romania's and Bulgaria's EU accession. This may have dissipated the uncertainty of Romanian and Bulgarian migrants about the chances of gaining EU citizenship. In this perspective, we can presume that the turning point for the labour market conditions of Romanians and Bulgarians hosted in Italy can be dated back to 2003, well before the official entry year.

To focus on such changing market conditions over the accession period, we sketch a simple matching model where individuals have idiosyncratic preferences for the

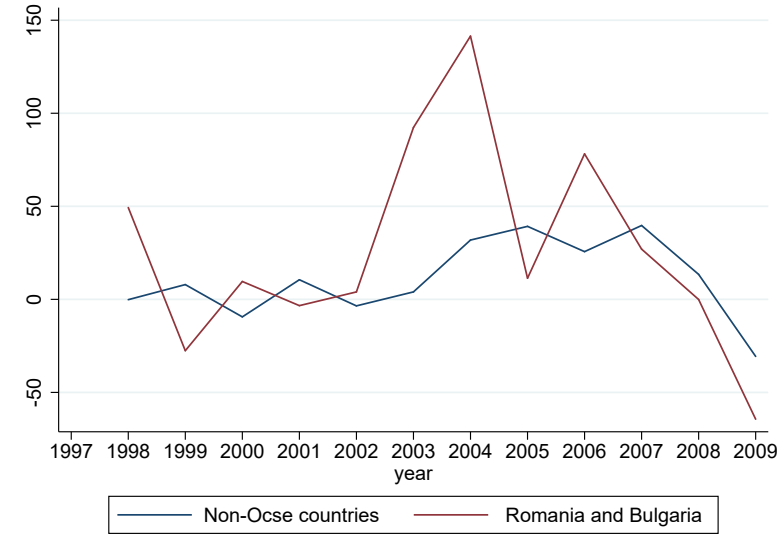
[3]On the causal effects of permanent residency rules on immigrants' labour market integration see Arendt et al. (2021) and the literature quoted therein.

Figure 1: Foreign Direct Investment

(a) Foreign direct investment, net inflows (BoP, current US$)



(b) Growth rate foreign direct investment, net inflows



market for employment versus alternative activities such as, say, self-employment. In this perspective, labour market participation becomes endogenous. The model has some immediate predictions. First, the perspective of accession concedes more bargaining power to Romanian and Bulgarian employees, leading to higher wages and better conditions at the workplace (i.e., less disutility associated with the job performed). Second, accession pushes a fringe of Romanian and Bulgarian immigrants to leave the host labour market, and opt for alternatives like entrepreneurial activities or return migration. These predictions are broadly supported by the evidence we obtain from Italian data. By exploiting a random sample of employees from the dataset WHIP-SALUTE, which allows us to match Romanian and Bulgarian workers with a control set of non EU-workers in year 2003, we find a substantial impact of the (anticipated) EU accession since 2004.

We show that Romanian and Bulgarian workers enjoyed both higher salaries and better working conditions, as measured by the rate of injuries at the workplace, relative to other immigrants. Our findings also suggest that Romanians opted to a larger extent for self-employment and, later on, for migration toward other EU countries. These results are reinforced when we restrict our sample to Northern Italy, where the unofficial labour market is relatively less relevant as argued, among others, by Mastrobuoni and Pinotti (2015).

After reporting a brief history of Romania's and Bulgaria's EU accession processes in Section 2, Section 3 presents the data and some "stylized facts" on wages, workplace conditions and self-employment. These "facts" - which emerge by com-

paring Romanians and Bulgarians with a synthetic control drawing from groups of other non-OECD immigrants - clearly indicate that EU accession has favoured Romanians and Bulgarians over other immigrants. In Section 4, we sketch a theoretical model consistent with the stylized facts illustrated in the previous section, leaving all formal details to the Appendix. Then, in Section 5, we describe the identification strategy, based on nearest neighbor matching, and present the econometric evidence. Our findings show that immigrants from Romania and Bulgaria obtained better employment conditions. Also, the perspective of EU accession seems to have encouraged a part of Romanian and Bulgarian immigrants to leave the market for employment to become entrepreneurs. Section 6 concludes.

2 The Accession Process

Romania and Bulgaria submitted their official application for membership in the European Union in 1995. Since such countries gave support to NATO during the Kosovo war (1998-1999), western politicians started to have a more favorable attitude towards their applications. For Romania and Bulgaria, however, getting into the EU represented a huge challenge, due to the deficiencies in their bureaucratic and legal system and the backwardness of their economy: per-capita incomes were equal to one-third of the EU average. As reported by the Economist (August 5, 1999), the civil services in Romania and Bulgaria "are corrupt, short of cash and talent, and patently ill-equipped to rewrite the laws of their countries to fit the complex EU rulebook", moreover "both countries have creaking and far from independent legal systems.

And their economies are far too weak, so far, to compete with even the poorest of those in the EU". Although the obstacles to entry were substantial, in the early 2000s Romania and Bulgaria managed to implement a wide range of reforms which consolidated the democratic system and the rule of law while experiencing, at the same time, sustained economic growth. Consequently, the "Association Committee" held in June 2004 recognized the good progress made for the preparation of accession, even though more effort was to be put in the reform of the judiciary and in other central issues, such as the adoption of environmental rules and competition policy: see Commission of the European Communities (2004). Although there was still much to do, the pathway to entry was guaranteed[4], and foreign direct investment flowed in, as illustrated in Figure 1.

In September 2006, the European Commission confirmed the date of accession on the 1st of January 2007, announcing that Bulgaria and Romania would meet no direct restriction. At the same time, the Commission would strictly monitor the reform process of the judiciary and the fight against corruption and organized crime. Even if EU member states could impose on Romanian and Bulgarian citizens limitations on their permit to work up to seven additional years, the number of Romanian and Bulgarian expats was already substantial. Between 2000 and 2010, the Romanian migration about tripled and the country experienced one of the largest increases of high-skill emigration into the G20 countries: see World Bank (2018). In 2007, 2m Romanians and 800,000 Bulgarians were living abroad, and Italy alone hosted half a million Romanians. As reported by OECD (2019), over 50 percent

[4]See The Economist, September 28, 2006.

of the increase in Romanian migration to Italy occurred during the period of the accession of Romania to the EU, between 2005-2006 and 2010-2011.[5]

3 Data Description and Some Facts

We use the WHIP-SALUTE dataset on a 1:15 random sample of employees in the Italian territory. This dataset combines longitudinal administrative data on working histories from the Italian Social Security authority (INPS) with administrative records on workplace injuries from the Italian Workers' Compensation Insurance authority (INAIL).

Career data from INPS provide details on the duration of each employment relationship (including the starting and the termination dates), number of weeks worked per year, part-time or full-time position and annual earnings. This dataset also includes information on worker attributes (e.g., age, gender, birthplace, place of work, and occupation, i.e. apprentice, blue or white collar) and firm characteristics (e.g., number of employees and sector). The INPS administrative archives also allow us to track self-employment spells.

The INAIL dataset offers information about workplace injuries, including the date of occurrence, the duration of injury-related leave, and injury description. The

[5] Among the new immigrants from Romania and Bulgaria many were Roma, an ethnic group that has been blamed for the upsurge in violent crime. Stirred by anti-migration feelings, the Berlusconi government promised to round up all jobless foreigners on the legal ground that foreigners who had no means of support could be expelled from other EU members (see The Economist, May 29, 2008). In the same mood, repatriation policies mainly targeting the Roma immigrants were adopted in France under President Sarkozy. On the "gypsy" issue, see also Hristova (2007).

dataset covers all injuries certified by physicians that result in a leave of more than three days. The dataset contains accurate information from the medical report which permits to distinguish between immediate care (IC) injuries and non-immediate care (NIC) ones: see Bena et al. (2012). The former refer to workplace injuries that require immediate hospital treatment and, thus, are less susceptible to reporting bias, alike the concept of "severe injuries" adopted by Boone and Van Ours (2006) and Boone et al. (2011).[6]

Moreover, the INAIL dataset contains information on the hour of the day the accident has occurred. This information allows us to classify as overtime and night shift injuries the workplace accidents occurring between 6 pm and 7 am. The occurrence of overtime and night injuries provides valuable information about the assignment of workers to arduous and unpleasant working conditions. The literature on occupational health has documented the negative effect of night shift work on psycho-physical health conditions: see Costa (2003).

Most of female workers, from Romania in particular, are employed as caregiver or domestic workers. Since the administrative dataset does not contain reliable information on these occupations, we are compelled to drop female workers from the dataset. This limitation is particularly unfortunate, considering the importance of this sector for female immigrants.

We retain non-EU non-native male workers of age less than 55 who migrated from

[6]The broad category of severe injuries, which implies several days of absence from work, may still suffer from under-reporting, if the days of absence are reported as sick leave periods: see Bena et al. (2012). The classification of IC injuries thus refines the definition of "severe injuries". See also Morantz (2013) for a similar classification of the types of injuries susceptible to reporting bias.

low-income countries (i.e., we exclude individuals born in North America, Japan, Australia etc.) and entered the Italian labor market during the 1998-2003 period for the first time. We follow these workers from their entry up to the fifth year of potential labour market experience: over this period, non-EU workers were still exposed to the risk of being expelled from Italy if they were not legally employed or if, after having lost their job, they did not manage to find a new one by the time unemployment benefits expired. Only after having been living and working continuously and legally in Italy for five years, non-Eu citizens could apply for the EC Residence Permit for Long-Term Residents. Thus, we target migrants with 5 years or less of potential work experience, so to focus on individuals who still faced a risk of being deported in case of job loss.[7] The threat of deportation, in turn, reduced the length of job search and narrowed the range of alternative job opportunities.

Since our sample is not sufficiently representative of the Agriculture and Fishing industries, we exclude these sectors from the analysis. We also drop individuals that, in 2003, belonged to sectors with a small number of Romanian and Bulgarian employees; in all previous and subsequent years, individual observations from any sector are included in the study. This sample selection aims to prevent that certain sector dummies are able to predict exactly the treatment status in the matching process and, at the same time, to ensure the common support assumption. For similar reasons, we also exclude white collar workers in 2003.

[7]Ideally, one would like to exploit the discontinuity set by the threshold of 5 years of labor market experience to estimate the impact of legal restrictions on labor outcomes. Unfortunately, the small number of observations for individuals with more than five years of labor market experience does not deliver significant differences between treated and controls at the standard levels and fails to meet the conventional power of 80%.

To provide some preliminary evidence, we compare the labour outcomes of Romanian and Bulgarian workers with their synthetic controls: see Abadie and Gardeazabal (2003); Abadie et al. (2010). These controls are constructed by grouping all other non-OECD workers into 8 categories: Balkans, Eastern Europe, North Africa, South and Central Africa, Middle East, Caucasus, South America, and China. We consider 2004 as the first year of treatment, although some divergence is evident already after 2002.[8] In the econometric analysis, we will match treated individuals (Romanians and Bulgarians) with candidate controls - that is, individuals born in non-OECD countries - using characteristics measured in 2003, just after the massive regularization of illegal immigrants that occurred in 2002 with the "Bossi-Fini law".

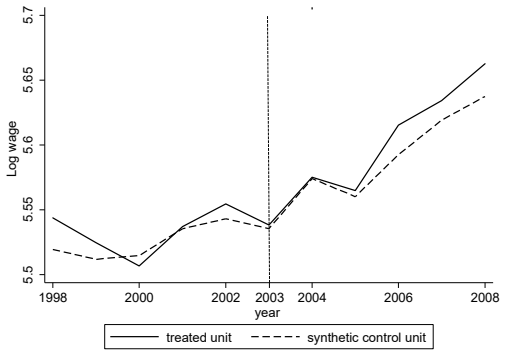
From the synthetic control analysis we present in Figure 2, three main stylized facts do emerge. First, the wage differential between Romanian and Bulgarian and other non-EU employees widens, as shown in Figure 2, panel (a).[9] Second, there is a marked improvement in the relative working conditions of Romanian and Bulgarian employees, as measured both by the rate of total injuries (Fig.2, panel (b)) and by the rate of immediate care injuries (Fig.2, panel (c)). This evidence suggests that the bargaining power of Romanian and Bulgarian workers awaiting EU accession grew, granting them both higher salaries and lower disutility of labour at the work-

[8]Figure A1 in the Appendix shows that the trends in average labor outcomes for the Romanian and Bulgarian migrants run parallel to those of non-OECD workers. The differences in levels, mainly due to the diverse composition of employment across sectors and occupations, call for the adoption of matching procedures that balance observed characteristics between treated and control groups. Unfortunately, we are unable to match our sample of Romanian and Bulgarian workers with a sample of Italian natives. Indeed, log wages and injury rates of Italian workers (available upon request) exhibit remarkable differences both in levels and trends from foreign workers.

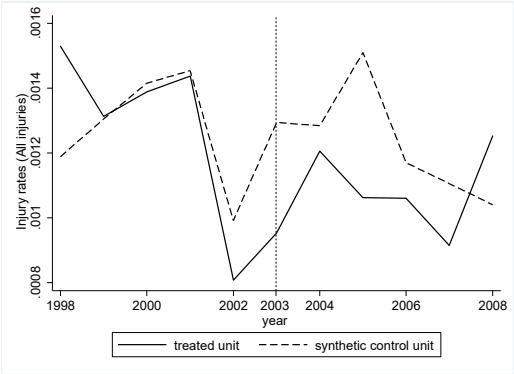
[9]When the same synthetic control procedure is implemented by using as first year of treatment either 2005 or 2006, we observe divergence in the outcomes in the pre-treatment period.

Figure 2: Synthetic control analysis

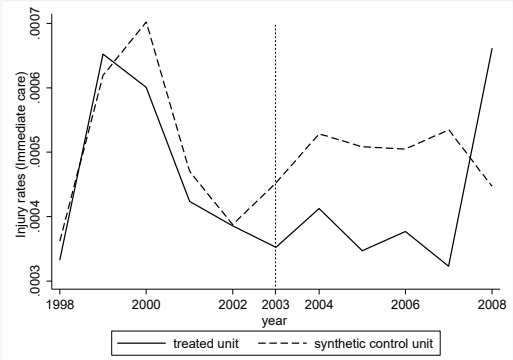
(a) Log deflated wage



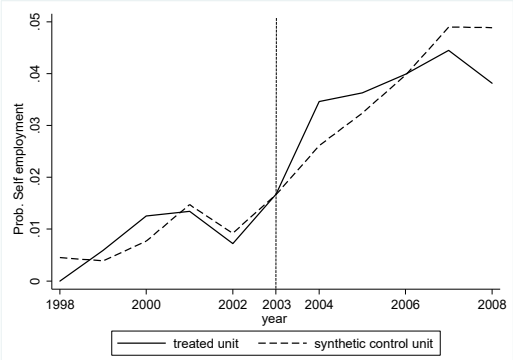
(b) Injury rates (All inj.)



(c) Injury rates (Immediate care inj.)



(d) Prob. self-employment



The panels of this figure display the pattern of four different labour outcomes of Romanian and Bulgarian (solid lines) and their counterfactual evolution (dashed lines) that are constructed using a synthetic control group. The predictor variables used are log deflated wage, average injuries rates (all and immediate care), proportion of of self-employed, proportion of workers in each sector and region, age, potential labour market experience, number of weeks worked. The pre-intervention time period is 1998-2003.

place. There is also a third aspect that emerges, as emphasized in Fig.2, panel (d). The prospective EU citizenship seems to have somewhat encouraged Romanians and Bulgarians to opt for self-employment. These facts are consistent with the theoretical predictions of the model that we are going to outline in the next section, where the participation of individuals in the market for employment is endogenous, and depends on the alternative options available to the worker.

4 A matching framework with endogenous labour market participation

In this section, we sketch a simple matching model to analyze how different opportunities available to different groups of individuals can affect their labour market outcomes. The model is presented in full detail in Appendix A. By focusing on migrants, our framework explicitly recognizes that some groups have restrictions on their set of choices which differ from the limitations applied to other groups. Consider, for instance, a EU country. Non-EU immigrant workers will have limited opportunities because they are exposed to deportation, or because it may be more difficult for them to start a business, or benefit from welfare assistance, as argued in Ruhs (2013). Further, economic conditions across the countries of origin may be varied, affecting the value of repatriation. The available opportunities improve for those foreign immigrants who gain EU citizenship since, although they may still

suffer taste discrimination,[10] they will have the same rights as the natives. Thus, EU accession of a country like Romania can have a relevant impact on Romanian migrants living in other EU countries. In particular, the prospective membership can affect immigrants' employment conditions in the host country and, even, their incentive to participate in the local market for employment.

In our framework, we assume that the individuals within each group have idiosyncratic preferences toward two alternative activities, labelled as "employment" (E) and "non-employment" (N). In the "employment" status, the individual is employed by a firm which pays a wage w and imposes an amount of effort[11] equal to e. On the other hand, "non-employment" captures a variety of alternatives to the employee status. Under the non-employment status, some individuals will still participate in the labour market as unemployed, looking for a suitable vacancy. However, depending on their individual inclination, other non-employed individuals will decide to stay out of the market for employment and opt for alternatives such as self-employment, repatriation, or even illicit activities (see also Pissarides (2000)). The remuneration of non-employment is denoted by z_i, where i denotes the group to which the individual belongs. Since we deal with migration, the opportunities summarized in z_i will depend on characteristics such as being a non-EU immigrant (e.g., Moldavian or Ghanian), being an EU immigrant (e.g., Slovakian) or being a native citizen (e.g., Italian).

[10] On "taste discrimination" see, among others, Black (1995) and Fanfani (2022), after the seminal work of Becker (1957). As mentioned in Note 8, we cannot assess the presence of taste discrimination because we are unable to match our sample of Romanian and Bulgarian workers with a sample of Italian natives.

[11] Here, 'effort' denotes the set of disamenities (such as risk of injury, overtime, number of night shifts, unpleasant tasks) associated with the job.

The idiosyncratic preferences associated with the alternative states, E and N, capture the personal inclination for an activity relative to the other and imply that not all the individuals will participate in the market for employment, even when the condition $w - e > z_i$ holds true. Moreover, a change in the payoff from non-employment, z_i, will affect both the terms of employment in the firm-worker bargaining process and the participation itself in the market for employment.

As shown in Appendix A, the model has two main implications. When individuals who belong to group i gain better opportunities in the non-employment status (i.e., they enjoy a higher level of z_i), then:

(i) when employed, they will be able to obtain either a higher wage (given the effort required) or better working conditions (e.g., jobs that are associated with less fatigue or lower injury rates) for a given level of the wage; also

(ii) the participation in the market for employment will drop, as some individuals will opt for alternatives such as self-employment or even return to their origin country.

Summarizing, an increase in z_i represents, on the one hand, an increase in the outside option available to the worker when bargaining with the employer. Take Romanians as an example. If FDI towards Romania increases, job opportunities back home for Romanian migrants will improve. The threat to repatriate becomes stronger, inducing local (say, Italian) employers to concede better working conditions, both in terms of higher wages and lower labour disutility (such as reduced night shifts). On the other hand, the perspective of obtaining EU citizenship may also induce Romanian migrants to abandon the local (Italian, say) market for employment to move to other countries (such as Germany or UK) or, given the rights that they

are going to acquire, to start a new business in the host country.

In short, in a framework where Romanians and Bulgarians exhibit heterogeneous preferences for alternative occupations, the better opportunities created by EU accession have varied effects. While a fringe of individuals will quit the market for employment to pursue alternative options (say, self-employment), the inframarginal individuals who remain attached to the market for employment will be able to achieve better job terms.

5 Identification strategy

To evaluate the impact of EU accession on host workers and avoid selection bias due to unobserved differences between treated and controls, we implement the nearest neighbor matching estimation procedure with Mahalanobis distance. Thus, we match each Romanian and Bulgarian employee with a non-EU employee (i.e., one matched control per treated) with the closest value of several individual, job and firm characteristics in 2003. These attributes include year of entry, age, log deflated wage (1998 euro), log of the employer's size and number of weeks worked. We also use dummies indicating: i) firms below 15 employees (subject to special employment protection legislation); ii) part time; iii) blue collar (0 for apprentice); iv) at least one self-employment spell; v) Ateco 2007/Nace Rev. 2, two digit classification and, vi) Italian region of residence.[12] For each worker we choose the attributes of the

[12]We have grouped some Italian regions together when the reduced number of treated individuals would otherwise lead us to exclude them due to balancing problems in the matching procedure.

occupation which yielded the highest remuneration in 2003. We also exploit the available measures on injuries to match treated with controls. Since workplace accidents are rare events, we compute the overall injury rate and the immediate care injury rate starting from the year of entry t_0, up to 2003. To this purpose, we divide the number of accidents by the total number of weeks worked computed over the period $[t_0, 2003]$. However, since the same individual injury rate can be associated with a different number of workplace accidents, we also include in the matching procedure the *total* number of injuries, immediate care injuries, and overtime and night shift injuries computed over the period $[t_0, 2003]$. Additional interactions of the above mentioned variables are added, so to improve the quality of the matching. In addition to the year of entry and the number of working weeks in 2003, we also match on the total number of weeks worked since entry, so to compare the treated workers with controls with the closest labour market experience and, thus, with a similar dynamics in the hazard rates.[13] As shown in Table 1, the nearest neighbor matching brings the values of all standardized differences below 0.03, and it makes the variance ratios closer to one, in an interval $(0.5, 2)$. Nearest neighbor matching seems to be the most accurate method in balancing industry and regional dummies, almost performing an exact matching on these variables.

[13]Injury hazard rates are a non-monotonic function of time: see Leombruni et al. (2013).

Table 1: Balancing before and after nearest neighbor matching.

	Standardized Differences		Variance Ratios	
	Unmatched	Matched	Unmatched	Matched
Variables measured in $[2001, 2003]$				
Total nr. weeks worked	-0.1674	-0.0217	0.6965	0.9876
Injury rates (all injuries)	-0.1285	0.0214	0.2571	1.0895
Injury rates (immediate care)	-0.0665	0.0071	0.3347	1.0042
Injury rates (overtime & night)	-0.0543	0.0120	0.1890	1.3360
Total nr. of injuries (all injuries)	-0.2301	0.0259	0.4136	1.1499
Total nr. of injuries (immediate care)	-0.1204	0.0054	0.4658	1.0183
Total nr. of injuries (overtime & night)	-0.1010	0.0104	0.4587	1.2892
Variables measured in 2003				
year of entry	0.3358	0.0261	0.6168	1.0055
age	0.1956	0.0260	1.0954	1.0711
log deflated wage	0.1874	0.0213	0.7289	1.2653
log size	-0.3687	-0.0192	0.5226	1.0382
≤ 15 employees	0.3429	-0.0108	0.7657	1.0132
Part time	0.1407	0.0160	1.3139	1.0276
Blue collar	0.1674	-0.0032	0.4842	1.0172
Nr. weeks worked	0.1945	0.0100	0.8552	1.0570
Episodes of self employment	0.0193	-0.0014	1.1566	0.9901
ATECO 2007/NACE Rev. 2				
CB, textiles, apparel, leather etc.	-0.3392	0.0000	0.1281	1.0000
CC, wood and paper products, and printing	-0.0261	0.0044	0.8692	1.0252
CH, basic metals and fabricated metal prod	-0.0378	0.0045	0.8538	1.0199
CK, machinery and equipment	0.0184	0.0027	1.1442	1.0194
CL, transport equipment	-0.0715	0.0000	0.4068	1.0000
CM, repair and install. mach. and equip.	-0.0507	0.0048	0.8827	1.0127
F,Construction	0.3794	-0.0156	1.0545	1.0040
G, Wholesale,retail trade, repair of motor etc.	-0.0070	0.0028	0.9779	1.0092
H,Transportation and storage	0.0060	0.0085	1.0178	1.0249
N, Administrative and support service act.	-0.2719	0.0035	0.4160	1.0153
Italian regions (grouped)				
Basilicata and Calabria	-0.0047	0.0000	0.9535	1.0000
Campania	-0.1562	0.0000	0.3229	1.0000
Emilia Romagna	-0.2862	-0.0033	0.4278	0.9871
Friuli Venezia Giulia	-0.0207	0.0000	0.8724	1.0000
Lazio	0.6597	0.0085	5.7652	1.0097
Liguria	-0.1378	0.0000	0.3447	1.0000
Lombardia	-0.2960	-0.0141	0.6822	0.9760
Marche	-0.0768	-0.0013	0.6400	0.9918
Molise	0.0344	0.0000	2.2482	1.0000
Piemonte e Val d'Aosta	0.2671	0.0049	1.8733	1.0087
Puglia	-0.0501	0.0000	0.5943	1.0000
Sardegna and Sicilia	-0.0541	0.0025	0.5329	1.0355
Toscana	-0.0758	0.0030	0.7855	1.0103
Trentino Alto Adige	-0.0467	0.0034	0.6820	1.0319
Umbria	0.0026	0.0013	1.0182	1.0092
Veneto	-0.0338	-0.0021	0.9387	0.9960
N. observations	39112	5429	39112	5429

The table reports, for the unmatched and matched sample, the standardized differences and the variance ratios for the variables used in the nearest neighbor matching with Mahalanobis distance (one match per observation). The first variables are computed in the interval $[2001, 2003]$. The remaining ones are computed in 2003. Additional variables have been used to improve the balancing but are not shown to save space. These variables are: 1) interactions between age and regional dummies; 2) interactions between log deflated wage and sectorial dummies; 3) interactions of the dummy ≤ 15 employees with i) injury rate (overtime & night injuries) in 2001-2003 period.

Finally, when we consider matching years alternative to 2003, the balancing properties fail to be satisfied. Table 2 reports the mean absolute value of the standardized differences, expressed as a percentage, for the covariates used in both the nearest neighbor and propensity score procedures when using different years to match treated and control groups.[14]

Table 2: Quality of matching using different years to match treated and controls.

year	Nearest neighbour	Propensity score	
	Mean Bias	Pseudo R^2	Mean bias
2003	0.59	0.002	1.0
2004	0.65	0.003	1.4
2005	0.84	0.002	1.3
2006	0.85	0.003	1.5
2007	1.27	0.005	1.6

The table presents the mean absolute value of the standardized differences, expressed as a percentage, for the covariates used in both the nearest neighbor and propensity score procedures. These procedures utilize different years to match treated and control groups. The table also includes the Pseudo R-squared value for the propensity score matching, which represents the goodness-of-fit measure for the probability of being treated in the matched sample based on the covariates. The covariates used for nearest neighbor matching are those listed in Table 1, while the covariates used for propensity score matching are those listed in Table A3.

5.1 Econometric Evidence

The evidence we present builds on the nearest neighbour matching method and considers a broad set of outcomes related to: (i) working conditions at the workplace – as measured by the wage and the rate of on-the-job injuries and, (ii) participation in the host market for employment. The model sketched above predicts that an increase in the "outside options" of immigrants will enable them to obtain higher salaries together with milder job conditions. Such predictions are strongly supported

[14]Year 2002 is not considered as a matching option because of the implementation of the Bossi-Fini Law.

by our findings. On the other hand, the model also predicts that the incentive for immigrants to participate in the local market for employment is reduced. The empirical support we get for this implication is more nuanced, as we discuss in what follows. By referring to Table 3, we find that the EU-accession shock has an impact of wages that ranges from +1.7% to 5% between 2004 and 2006. The impact on working conditions, as measured by a battery of injury rates, is quite remarkable. Injury rates (all injuries) drop by something like 34% for Romanians and Bulgarian immigrants over the same period. Further, when injury rates are aggregated (2004-2006), the drop is even more sizeable.

Interestingly, the reduction of immediate care injuries for the treated group, relative to other migrants, is equal to -38%, while the corresponding figure for light injuries amounts (only) to -21%. Since the reduction in IC injuries is unlikely to be affected by changes in reporting behavior, our findings provide robust evidence of an improvement in working conditions.

Some additional insights can be drawn from comparing the changes in the percentage of non-IC injuries -which are influenced both by changes in working conditions and by reporting behavior- with the changes in IC injuries.

Table 3: Treatment effects on wages and injuries - Nearest neighbour matching

	Mean Treated	Mean Controls	Difference	A.I. Standard errors
		Log deflated wage		
log $wage_{2004}$	5.5778	5.5610	0.0168***	(0.0058)
log $wage_{2005}$	5.5681	5.5433	0.0248***	(0.0068)
log $wage_{2006}$	5.6169	5.5670	0.0500***	(0.0074)
log $wage_{2007}$	5.6378	5.5914	0.0463***	(0.0084)
		Injury rates: All injuries		
Injury $rate_{2004}$	0.0657	0.0990	-0.0333**	(0.0163)
Injury $rate_{2005}$	0.0555	0.0820	-0.0265***	(0.0088)
Injury $rate_{2006}$	0.0565	0.0871	-0.0306***	(0.0107)
Injury $rate_{2007}$	0.0458	0.0736	-0.0278**	(0.0116)
		Injury rates: Light injuries		
Injury $rate_{2004}$	0.0416	0.0602	-0.0186**	(0.0084)
Injury $rate_{2005}$	0.0366	0.0484	-0.0118*	(0.0064)
Injury $rate_{2006}$	0.0357	0.0486	-0.0129*	(0.0069)
Injury $rate_{2007}$	0.0297	0.0509	-0.0212**	(0.0107)
		Injury rates: Immediate care injuries		
Injury $rate_{2004}$	0.0241	0.0388	-0.0147	(0.0140)
Injury $rate_{2005}$	0.0189	0.0336	-0.0147**	(0.0062)
Injury $rate_{2006}$	0.0208	0.0385	-0.0177**	(0.0079)
Injury $rate_{2007}$	0.0161	0.0227	-0.0066	(0.0048)
		Injury rates: Overtime & night injuries		
Injury $rate_{2004}$	0.0131	0.0290	-0.0159**	(0.0068)
Injury $rate_{2005}$	0.0184	0.0223	-0.0039	(0.0059)
Injury $rate_{2006}$	0.0188	0.0287	-0.0099	(0.0093)
Injury $rate_{2007}$	0.0160	0.0242	-0.0081	(0.0078)
		Aggr. Injury rates 2004-2006		
All injuries	0.0588	0.0820	-0.0232***	(0.0062)
Light injuries	0.0382	0.0486	-0.0104**	(0.0048)
Immediate care injuries	0.0207	0.0334	-0.0128***	(0.0039)
Overtime & night injuries	0.0155	0.0228	-0.0073**	(0.0032)
		Probability of job-to-job transition		
job-to-job_{2004}	0.0207	0.0205	0.0002	(0.0036)
job-to-job_{2005}	0.0200	0.0192	0.0007	(0.0039)
job-to-job_{2006}	0.0231	0.0245	-0.0014	(0.0040)
job-to-job_{2007}	0.0194	0.0230	-0.0036	(0.0044)

All estimates are based on the observed outcomes of workers until they remain have five or less years of potential labour market experience. The number of observations used to estimate the effects in 2004, 2005, 2006, 2007 and in the period 2004-2006 is respectively equal to 9584, 8314, 7102, 6086, 9964.

The relatively smaller reduction of light injuries suggests that Romanian and Bulgarian workers were less hesitant to report such type of lesions, compared to the past.[15]

The reduction of overtime injuries for the treated group, relative to other migrants, is equal to -32%, suggesting a more favorable reallocation to shifts for Romanian and Bulgarian workers.

We take these findings as neat evidence of the benefits that the perspective of EU accession had on migrants from new entrant countries. Such advantages seem to have come mainly in terms of lower disutility of labour[16], rather than higher wages. This outcome is hardly surprising when one considers the substantial wage rigidity of the Italian labour market: see, among others, Devicienti et al. (2019).

Finally, we show that the perspective EU accession had negligible effect on job-to-job transitions. This finding suggests that Romanian and Bulgarian workers exploited the gain in bargaining power mostly within the current employment relationship.

When we restrict the analysis to the Northern regions of Italy (Piedmont, Liguria, Lombardy, Veneto, Friuli, Trentino, Emilia-Romagna), which are less contaminated by unofficial or illegal forms of employment, our conclusions are reinforced: see Table 4. Further, job-to-job transitions drop significantly. This suggests that Romanians

[15]For a discussion about workers' willingness to report injuries, see Charles et al. (2022).

[16]The improvement in working conditions can also be inferred from "job duration" measures. As suggested by Gronberg and Reed (1994), job duration is closely related to favorable job attributes: see also Manning (2003, Ch.8). Indeed, as shown in Table A1 and Table A2 in Appendix B, Romanian and Bulgarian employees experimented a significant drop in the probability of non-employment, relative to the control group. Similar conclusions are reached when we look at the number of weeks worked, which increased for the treated groups.

and Bulgarians enjoyed better working conditions by their current employer to an extent such to reduce turnover.

Table 4: Northern regions only - Treatment effects on wages and injuries (nearest neighbour matching).

	Mean Treated	Mean Controls	Difference	A.I. Standard errors
Log deflated wage				
log wage$_{2004}$	5.6054	5.5820	0.0235***	(0.0059)
log wage$_{2005}$	5.5968	5.5519	0.0450***	(0.0081)
log wage$_{2006}$	5.6413	5.5857	0.0557***	(0.0082)
log wage$_{2007}$	5.6617	5.6143	0.0474***	(0.0091)
All injuries				
Injury rate$_{2004}$	0.0730	0.1174	-0.0445***	(0.0127)
Injury rate$_{2005}$	0.0672	0.1058	-0.0387***	(0.0124)
Injury rate$_{2006}$	0.0664	0.0968	-0.0304**	(0.0143)
Injury rate$_{2007}$	0.0508	0.0951	-0.0443***	(0.0133)
Light injuries				
Injury rate$_{2004}$	0.0479	0.0819	-0.0340***	(0.0111)
Injury rate$_{2005}$	0.0440	0.0620	-0.0180*	(0.0093)
Injury rate$_{2006}$	0.0428	0.0602	-0.0174*	(0.0090)
Injury rate$_{2007}$	0.0325	0.0673	-0.0348***	(0.0117)
Immediate care injuries				
Injury rate$_{2004}$	0.0250	0.0355	-0.0105	(0.0064)
Injury rate$_{2005}$	0.0232	0.0439	-0.0207**	(0.0081)
Injury rate$_{2006}$	0.0236	0.0366	-0.0130	(0.0110)
Injury rate$_{2007}$	0.0183	0.0278	-0.0095	(0.0066)
Overnight & night injuries				
Injury rate$_{2004}$	0.0173	0.0345	-0.0172**	(0.0075)
Injury rate$_{2005}$	0.0218	0.0320	-0.0101	(0.0092)
Injury rate$_{2006}$	0.0144	0.0310	-0.0166*	(0.0096)
Injury rate$_{2007}$	0.0175	0.0270	-0.0096	(0.0110)
Aggr. Injury rates 2004-2006				
All injuries	0.0674	0.0990	-0.0316***	(0.0074)
Light injuries	0.0439	0.0639	-0.0201***	(0.0061)
Immediate care injuries	0.0236	0.0351	-0.0115***	(0.0041)
Overnight & night injuries	0.0168	0.0289	-0.0121***	(0.0045)
Probability of job-to-job transition				
job-to-job$_{2004}$	0.0217	0.0179	0.0039	(0.0039)
job-to-job$_{2005}$	0.0193	0.0222	-0.0029	(0.0048)
job-to-job$_{2006}$	0.0229	0.0361	-0.0132**	(0.0057)
job-to-job$_{2007}$	0.0190	0.0294	-0.0104*	(0.0062)

All estimates are based on the observed outcomes of workers that in 2003 were located in northern regions until they remain five or less years of potential labour market experience.

Overall, consistently with the findings in Bagga (2023), our evidence suggests that the gains obtained by Romanian and Bulgarian employees were larger in the North, where firms have less labour market power (see Caselli et al., 2023).

Table 5 presents outcomes that concern alternatives to being employed. Our theoretical framework suggests that -when such alternatives get better- the participation in the host labour market tends to fall. For instance, the perspective to become a EU citizen may encourage immigrants to become entrepreneurs. Indeed, in 2004, we find that Romanians and Bulgarians are 33% more likely to be self-employed than immigrants in the control group.

Table 5: Treatment effects on self-employment and exit - Nearest neighbour matching.

	Mean Treated	Mean Controls	Difference	A.I. Standard errors
	Probability of self-employment			
pr. self-employment$_{2004}$	0.0363	0.0273	0.0090**	(0.0041)
pr. self-employment$_{2005}$	0.0378	0.0327	0.0051	(0.0048)
pr. self-employment$_{2006}$	0.0406	0.0375	0.0031	(0.0061)
pr. self-employment$_{2007}$	0.0483	0.0549	-0.0066	(0.0071)
episodes self empl.$_{[2004-2006]}$	0.0875	0.0735	0.0140*	(0.0075)
	Attrition: Exit from Dataset			
exit$_{2004}$	0.0253	0.0263	-0.0010	(0.0037)
exit$_{2005}$	0.0166	0.0272	-0.0106**	(0.0044)
exit$_{2006}$	0.0259	0.0149	0.0110**	(0.0049)
exit$_{2007}$	0.0460	0.0214	0.0246***	(0.0052)

All estimates are based on the observed outcomes of workers until they remain five or less years of potential labour market experience. The number of observations used to estimate the effects in 2004, 2005, 2006, 2007 and in the period 2004-2006 is respectively equal to 9584, 8314, 7102, 6086, 9964.

At the same time, we might expect more attrition from the dataset (denoted by "exit"), since some of the workers who were resident in Italy opted either for repatriation, or for migration to other EU member states, such as Germany or UK. After a significant drop in attrition in 2005, this prediction is strongly supported

for the years 2006-2007, when the bureaucratic constraints to movement across EU members were (or were going to be) removed: in 2006, the chance of dropping from the dataset increased by +74% and, in 2007, by +115% relative to the control group.

Such findings are substantially reinforced when we consider Northern Italy only: see Table 6. The propensity to self-employment rose by +45% and by +29% in the years 2004 and 2005, respectively, compared to immigrants in the control group. Again, after a significant drop in 2005, attrition rose by +65% in 2006 and +133% in 2007.

Table 6: Northern regions only - Treatment effects on self-employment and exit (nearest neighbour matching).

	Mean Treated	Mean Controls	Difference	A.I. Standard errors
	Probability of self-employment			
pr. self-employment$_{2004}$	0.0438	0.0302	0.0137**	(0.0054)
pr. self-employment$_{2005}$	0.0455	0.0308	0.0148**	(0.0058)
pr. self-employment$_{2006}$	0.0420	0.0356	0.0063	(0.0066)
pr. self-employment$_{2007}$	0.0554	0.0519	0.0035	(0.0083)
episodes self empl.$_{2004-2006}$	0.1010	0.0715	0.0295***	(0.0086)
	Attrition: exit from dataset			
exit$_{2004}$	0.0231	0.0270	-0.0039	(0.0046)
exit$_{2005}$	0.0111	0.0201	-0.0090**	(0.0039)
exit$_{2006}$	0.0249	0.0151	0.0098**	(0.0048)
exit$_{2007}$	0.0456	0.0196	0.0260***	(0.0062)

All estimates are based on the observed outcomes of workers that in 2003 were located in northern regions until they remain five or less years of potential labour market experience.

To add robustness to our findings, we also implement an alternative matching technique, that is, propensity score matching. Tables A3, A4, and A5 in Appendix C show the balancing property of covariates and the estimated outcomes. The findings are qualitatively and quantitatively similar to those delivered by nearest neighbour

matching. Similar conclusions hold when we restrict our analysis to the sample of workers in the northern regions (see Tables A6 and A7 in the Appendix.)

Consistently with the predictions of the model, the rise in the outside options caused by EU accession had varied effects on Romanian and Bulgarian migrants. On the one hand, a fringe of individuals quit the Italian employment market to pursue alternative options, such as self-employment. At the same time, those who remained attached to the market for employment were able to achieve better job conditions.

6 Conclusions

As demonstrated by Naidu et al. (2016), the reduction of legal restrictions on immigrant workers can substantially reduce the power of employers. Our paper follows this path, but adds a relevant novelty. By looking at the accession process of Romania and Bulgaria, we show that the anticipation itself of acquiring of EU citizenship had relevant consequences on the labour market outcomes of Romanian and Bulgarian migrants in Italy. The strategy we adopt to evaluate the anticipation effect is key. While, in case of success, the entry of Romania and Bulgaria into the European Union would actually take place in 2007, the degree of confidence about their final admission was already quite high - in the business world - since 2003, as inferred from the dynamics of FDI.

By developing a matching framework where individuals can choose whether to take part in the market for employment, we analyze how the perspective removal

of legal restrictions affects labour market outcomes, both in terms of employment conditions and participation. Consistently with the predictions of the model, we find that the perspective EU entry had a positive impact on the employment conditions of Romanian and Bulgarian workers, both in terms of wages and job attributes. Also, Romanian and Bulgarian immigrants showed greater propensity to entrepreneurship, relative to other groups of migrants.

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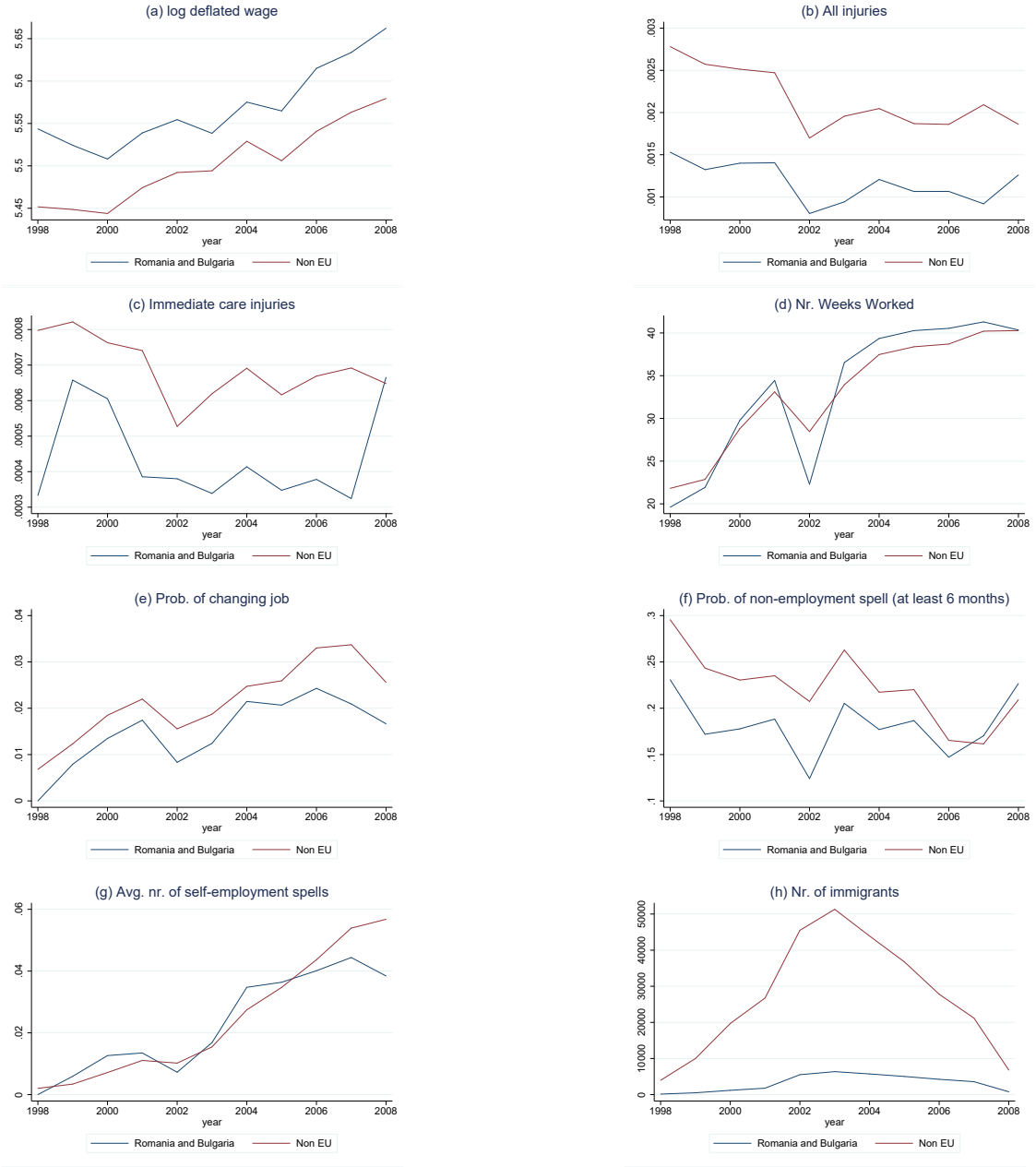
Appendix

Figure A1: Immigrants and labour outcomes



The panels of this figure display several labour outcomes of two groups of immigrants with five or less years of potential labour market experience in the 1998-2008 period: (i) Romanian and Bulgarian; (ii) other non-EU immigrants. The following variables are reported in panels: (a) average log of deflated wages (base 1998); (b) the average number of injuries; (c) the average number of immediate care injuries; (d) the average number of job to job transitions; (e) the average number of weeks worked; (f) the average number of non-employment spells (at least 6 months); (g) the average number of self-employment spells; (h) the total number of immigrants.

A A simple matching model with endogenous participation

In what follows, we develop a simple matching model to analyze how different opportunities available to different groups of individuals affect labour market outcomes. In general, some groups can be subject to restrictions on their set of choices, relative to others. Consider, for instance, a EU country. Non-EU immigrant workers will have limited opportunities because they are exposed to deportation, or because it may be more difficult for them to start a business or benefit from welfare assistance. Also, the economic conditions in the countries of origin may be varied. The available opportunities improve for those foreign immigrants who gain EU citizenship since, although they may still suffer taste discrimination, they will have the same rights as the natives.

We assume that the individuals within each group have idiosyncratic preferences toward two alternative activities, labelled as "employment" (E) and "non-employment" (N). For "employment", we mean being employed by a firm which requires an amount of 'effort' e - measuring the disamenities associated with the job - and pays a wage w. "Non-employment", instead, captures a variety of alternatives to the employee status, such as self-employment, return migration, unemployment, or even illicit activities. The remuneration of non-employment is denoted by z_i, where i denotes the group to which an individual belongs. Here, the opportunities summarized in z_i will depend on characteristics such as being a non-EU immigrant (e.g., Moldavian), being an EU immigrant (e.g., Slovakian) or being a native citizen

(e.g., Italian). Similarly to Card et al. (2018, p.S42), we postulate that the individuals have idiosyncratic preferences associated with the alternative occupations, ε_E and ε_N, which follow two identical Type-1 Extreme Value distributions with scale parameter equal to $\phi \geq 0$. The difference between such shocks may be thought as the relative individual inclination for an activity over the other.[17]

In the case of interest here, which focuses on immigrants from countries that are candidate to EU accession, the increase in z_i is generated both by better job opportunities back home, due to substantial foreign investment, and by greater disposition to undertake entrepreneurial activities in the host country, due to increased confidence in the forthcoming EU citizenship.

Define $\theta = \frac{V}{U}$ as the ratio between the number of vacancies, V, and the number of individuals who are looking for employment, U, and denote by $q(\theta) \equiv \frac{M}{V}$ the rate at which vacancies are filled by new matches (M), with $q'(\theta) < 0$. The rate at which workers looking for a job get employed is $\theta \cdot q(\theta) \equiv \frac{M}{U}$, and is increasing in θ.

We can now define the returns from the values of employment and non-employment, respectively V_E and V_N, as:

$$rV_E = w - e + \varepsilon_E - \lambda \cdot (V_E - V_N) \tag{1}$$

$$rV_N = z_i + \varepsilon_N + \theta \cdot q(\theta) \cdot max(V_E - V_N, 0) \tag{2}$$

where λ denotes the exogenous separation rate of a firm-employee match. Al-

[17]This assumption is quite similar to the one in Ahlfeldt et al. (2023), where individuals have Gumbel-distributed idiosyncratic preferences for employers (or sectors). See also Dube et al. (2022) and, in particular, Berger et al. (2023), who postulate worker-firm-specific taste shocks affecting the value of nonwage amenities.

though we assume that $w - e - z_i > 0$, the presence of idiosincratic shocks on the preference for the alternative activities implies that an individual will participate in employment only when the condition $V_E - V_N = \frac{w-e-z_i+(\varepsilon_E-\varepsilon_N)}{r+\lambda+\theta q(\theta)} \geq 0$ holds true[18], implying that:

$$(\varepsilon_E - \varepsilon_N) \geq z_i - (w - e) < 0 \tag{3}$$

By defining $x \equiv (\varepsilon_E - \varepsilon_N)$, x will follow a Logistic distribution $F(x) = \frac{\exp\left\{\frac{x}{\phi}\right\}}{1+\exp\left\{\frac{x}{\phi}\right\}}$. The individuals who participate in employment are such that $x \geq x^*$, where the critical value x^* is given by $x^* = z_i - (w - e)$. Thus, the fraction of individuals participating in employment is equal to

$$1 - F(x^*) = \frac{1}{1 + \exp\left\{\frac{x^*}{\phi}\right\}} \equiv \widetilde{F}(x^*). \tag{4}$$

Denoting by L_i the total number of individuals in group i, the labour supply to firms is given by $L_i \cdot \widetilde{F}(x^*)$.

The matching function is a standard constant-returns-to-scale Cobb-Douglas (see Pissarides, 2000):

$$M(U, V) = K \cdot U^{\beta} \cdot V^{1-\beta}, \quad \text{with } \beta \in (0, 1), \tag{5}$$

where V denotes the number of vacancies, U denotes the number of individuals who participate in the market for employment and are looking for a job, and K is a

[18]When it holds that $\phi = 0$, idiosyncratic preferences of individuals play no role anymore. Consequently, the model degenerates into the standard setup where individuals always strictly prefer employment to non-employment.

positive constant. Then, it holds that $q(\theta) = K \cdot \left(\frac{U}{V}\right)^{\beta}$ and $\theta \cdot q(\theta) = K \cdot \left(\frac{V}{U}\right)^{1-\beta}$.

Define the number of employed individuals by J. The flow into employment will be given by $\dot{J} = M(U,V) - \lambda \cdot J$. In the steady-state ($\dot{J}$=0), it holds that

$$M(U,V) = \lambda \cdot J, \tag{6}$$

where $U = L_i \cdot \widetilde{F}(x^*) - J$.

Firms open job vacancies at a cost $c > 0$ and match with the $L_i \cdot \widetilde{F}(x^*)$ individuals who participate in the employment market. We assume that, when the match between employer and potential employee is successful, the firm is able to observe the idiosyncratic preferences of the worker[19], summarized by x. On the other hand, when opening a new vacancy, the firm will have to calculate its expected value which, in turn, depends on the average value of x calculated on the subinterval $[x^*,+\infty)$.

The value of production per worker is equal to $A \cdot e$, where e is the effort required to the worker and $A > 1$. Thus, the returns from the value of a filled job (V_F) and the expected value of an open vacancy (V_V^e) are, respectively:

$$rV_F = Ae - w - \lambda \cdot (V_F - V_V^e) \tag{7}$$

$$rV_V^e = -c + q(\theta) \cdot (V_F - V_V^e). \tag{8}$$

Given the level of effort required on the job (e), the wage is determined by Nash

[19]This assumption is very similar to the one in Berger et al. (2023), where the firm and the worker observe and contract on the nonwage amenity draw.

bargaining, so that:

$$V_E - V_N = V_F - V_V^e. \tag{9}$$

By using (1)-(2)-(7)-(8) and (9), the bargained wage is equal to:

$$w = \frac{[r + \lambda + \theta q(\theta)] \cdot (Ae + c) + [r + \lambda + q(\theta)] \cdot [e + z_i - x]}{2r + 2\lambda + \theta q(\theta) + q(\theta)}. \tag{10}$$

The wage expression (10) has several features. The bargained wage is increasing in the value of production (Ae), in the level of effort required to the workers (e) and in the cost of opening a vacancy (c). Moreover, (10) shows that when an individual exhibits a bias toward non-employment (that is, when $x < 0$), the firm will concede a higher wage. On the contrary, when a worker has a bias toward employment (e.g., when $x > 0$), the firm will be able to pay a lower wage. Expression (10) also delivers additional implications.

First, an increase in z_i, the payoff of non-employment, will raise the wage in employment for any level of effort required, e. Alternatively, if there is some rigidity constraining the wage level w, an increase in z_i will be consistent with jobs that require a lower level of effort.

Second, since it holds that $\frac{dx^*}{dz_i} = 1 - \frac{dw}{dz_i} = 1 - \frac{r+\lambda+q(\theta)}{2r+2\lambda+\theta q(\theta)+q(\theta)} > 0$, an increase in the payoff in non-employment will reduce participation in the market for employment.

For the empirical purposes of the paper, the following Proposition summarizes the main testable implications of the model.

Proposition. When individuals belonging to group i gain better opportunities in the non-working status (i.e., they enjoy a higher level of z_i), then:

- when employed, they will be able to obtain either a higher wage (given the effort required) or, for a given level of the wage, to obtain better working conditions (e.g., jobs that are associated with less fatigue or lower injury rates);

- their participation in the market for employment will be lower. For example, an immigrant group who gains EU citizenship may enjoy better opportunities of self-employment.

Finally, we complete the presentation of the theoretical framework by concentrating on the properties of the value function of vacancies under the present approach. By exploiting the matching function (5) and the steady-state condition (6), we can rewrite the rate at which firms fill vacancies, $q(\theta)$, and labour market participants find a job, $\theta q(\theta)$, respectively as:

$$q(\theta) = K^{\frac{1}{1-\beta}} \left[\frac{L_i \cdot \widetilde{F}(x^*) - J}{\lambda \cdot J} \right]^{\frac{\beta}{1-\beta}} \tag{11}$$

and

$$\theta q(\theta) = \frac{\lambda \cdot J}{L_i \cdot \widetilde{F}(x^*) - J}. \tag{12}$$

A feature of the present approach is that, ex-ante, a firm does not know the wage it will pay to a newly hired individual. In other words, an employer with an open vacancy *expects* to pay the following wage:

$$w^e = \frac{[r + \lambda + \theta q(\theta)] \cdot (Ae + c) + [r + \lambda + q(\theta)] \cdot [e + z_i - \Psi]}{2r + 2\lambda + \theta q(\theta) + q(\theta)} \tag{13}$$

where $\Psi \equiv E(x \mid x \geq x^*) = [1 - F(x^*)]^{-1} \cdot \left[\int_{x^*}^{\infty} x dF(x)\right]$. Since $E(x)$, the unconditional mean of x, is equal to zero[20], it holds that $\Psi > 0$. Thus, firms expect to benefit from their ability to discriminate among workers with heterogeneous preferences.

The decision of a firm whether to open a new vacancy will depend on the wage it expects to pay. The value of a vacancy, given by $rV_V^e = -c + q(\theta)(V_F - V_V^e) = -c + \frac{q(\theta)}{r+\lambda+q(\theta)}[Ae + c - w^e]$ and, together with (13), it delivers the following expression:

$$rV_V^e = -c \cdot \Xi + \frac{q(\theta)}{2r + 2\lambda + \theta q(\theta) + q(\theta)}[(A-1)e - z_i + \Psi] \tag{14}$$

where $\Xi \equiv \frac{2r+2\lambda+\theta q(\theta)}{2r+2\lambda+q(\theta)+\theta q(\theta)} > 0$.

As expression (14) emphasizes, the value of a vacancy increases when the employer has the power to discriminate both across groups and individuals. The value of a vacancy is larger when the employer can exploit groups that exhibit low alternative opportunities, as denoted by z_i, due to taste discrimination or legal constraints. On the top of this, potential employers will also exploit the idiosyncratic preference bias towards employment which, on average, is equal to $\Psi > 0$. In short, employers' ability to discriminitate is a source of monopsonistic power (see, e.g., Manning, 2021).

As shown in sections A.1 and A.2 below, the expected return from a vacancy in expression (14) is such that: (i) There exists an internal solution for employment, J^*, such that the free-entry condition $rV_V^e = 0$ is satisfied. (ii) Under fairly general conditions, an increase in the payoff to non-employment, z_i, will decrease the expected

[20]Recall that x is defined as the difference between two identically distributed random variables.

value of a vacancy, V_V^e.

A.1 Existence of an internal solution for J^*

By exploiting (11) and (12), notice that, for $J \to 0$ (employment tends to zero), it holds that $q(\theta) \to +\infty$, and $\theta q(\theta) \to 0$. On the other hand, when $J \to L_i \cdot \widetilde{F}(x^*)$ (full-employment is approached), it holds that $q(\theta) \to 0$, and $\theta q(\theta) \to +\infty$. Thus, the following limits $\lim_{J\to 0} \frac{q(\theta)}{2r+2\lambda+\theta q(\theta)+q(\theta)} = 1$ and $\lim_{J\to L_i\cdot\widetilde{F}(x^*)} \frac{q(\theta)}{2r+2\lambda+\theta q(\theta)+q(\theta)} = 0$ hold true.

Recalling that $\Xi \equiv \frac{2r+2\lambda+\theta q(\theta)}{2r+2\lambda+q(\theta)+\theta q(\theta)}$, it also holds that $\lim_{J\to 0}\Xi = 0$ and $\lim_{J\to L_i\cdot\widetilde{F}(x^*)} \Xi = 1$.

Thus, by referring to (14), we obtain that $\lim_{J\to 0} rV_V^e = (A-1)e - z_i + \Psi > 0$ and $\lim_{J\to L_i\cdot\widetilde{F}(x^*)} rV_V^e = -c < 0$, which ensure the existence of an internal solution for employment, J^*, obtained by solving the free-entry condition $rV_V^e = 0$.

A.2 Impact of z_i on rV_V^e

The derivative $\frac{d(rV_V^e)}{dz_i}$ is given by the following expression:

$$-c\frac{d\Xi}{dz_i} + \frac{\left(-1+\frac{d\Psi}{dz_i}\right)\cdot q(\theta)}{[2r+2\lambda+q(\theta)+\theta q(\theta)]} +$$

$$+\frac{[(A-1)e-z_i+\Psi]}{[2r+2\lambda+q(\theta)+\theta q(\theta)]^2}\left([2r+2\lambda+\theta q(\theta)]\frac{dq(\theta)}{dz_i} - q(\theta)\frac{d(\theta q(\theta))}{dz_i}\right).$$

To discuss the sign of $\frac{d(rV_V^e)}{dz_i}$, notice that:

(i) Since $f(x) = dF(x)$, it holds that

$$sgn\left\{\frac{dq(\theta)}{dz_i}\right\} = sgn\left\{-f(x^*)\cdot L_i\cdot\frac{dx^*}{dz_i}\right\} < 0$$

and

$$sgn\left\{\frac{d(\theta q(\theta))}{dz_i}\right\} = sgn\left\{\frac{f(x^*)\cdot L_i}{\left[L_i\cdot\widetilde{F}(x^*)-J\right]^2}\cdot\frac{dx^*}{dz_i}\right\} > 0.$$

(ii) It holds that

$$\frac{d\Psi}{dz_i} = \frac{d\Psi}{dx^*}\cdot\frac{dx^*}{dz_i} = \frac{f(x^*)}{\widetilde{F}(x^*)}\left[\Psi - x^*\right]\cdot\frac{dx^*}{dz_i} > 0.$$

(iii) Finally, we have that

$$sgn\left\{\frac{d\Xi}{dz_i}\right\} = sgn\left\{\ -\tfrac{dq(\theta)}{dz_i}\left[2r+2\lambda+\theta q(\theta)\right] + \tfrac{d(\theta q(\theta))}{dz_i}\cdot q(\theta)\ \right\} > 0.$$

Thus, unless $\frac{d\Psi}{dz_i} > 0$ is very large[21], it will hold that $\frac{d(rV_V^e)}{dz_i} < 0$.

[21]The condition that $\frac{d\Psi}{dz_i}$ is not too large can be ensured by postulating that the degree of heterogeneity in preferences (captured by the scale parameter $\phi \geq 0$ of the Extreme Value distribution) is sufficiently small, so to reduce $\frac{d\Psi}{dx^*}$ enough.

B Additional evidence on job attributes

In this section we show additional estimates obtained from nearest neighbour matching which concern the impact of treatment on non-employment, number of weeks worked and job-to-job transitions.

Table A1: Treatment effects on non-employment, number of weeks worked and job-to-job transitions - Nearest neighbour matching.

	Mean Treated	Mean Controls	Difference	A.I. Standard errors
Probability of non-employment (> 180 days)				
pr. non-employment$_{2004}$	0.1697	0.2003	-0.0307***	(0.0102)
pr. non-employment$_{2005}$	0.1727	0.2033	-0.0304***	(0.0109)
pr. non-employment$_{2006}$	0.1422	0.1397	0.0025	(0.0111)
pr. non-employment$_{2007}$	0.1702	0.1439	0.0263**	(0.0120)
Number of weeks worked				
nr. weeks worked$_{2004}$	40.1137	38.7579	1.3558***	(0.3500)
nr. weeks worked$_{2005}$	41.0873	39.5093	1.5751***	(0.4030)
nr. weeks worked$_{2006}$	40.9282	40.1524	0.7761*	(0.4448)
nr. weeks worked$_{2007}$	41.4696	41.1518	0.3178	(0.5169)

All estimates are based on the observed outcomes of workers until they remain five or less years of potential labour market experience. The number of observations used to estimate the effects in 2004, 2005, 2006, 2007 and in the period 2004-2006 is respectively equal to 9584, 8314, 7102, 6086, 9964.

Table A2: Northern regions only - Treatment effects on non-employment, number of worked weeks and job-to-job transition (Nearest neighbour matching).

	Mean Treated	Mean Controls	Difference	A.I. Standard errors
Probability of non-employment (> 180 days)				
pr. non-employment$_{2004}$	0.1501	0.1743	-0.0242**	(0.0108)
pr. non-employment$_{2005}$	0.1453	0.1830	-0.0375***	(0.0116)
pr. non-employment$_{2006}$	0.1249	0.1235	0.0015	(0.0113)
pr. non-employment$_{2007}$	0.1633	0.1269	0.0364***	(0.0129)
Number of weeks worked				
nr. weeks worked$_{2004}$	42.0161	40.8864	1.1297***	(0.3936)
nr. weeks worked$_{2005}$	43.2405	41.1038	2.1315***	(0.4414)
nr. weeks worked$_{2006}$	42.6881	41.9722	0.7164	(0.4765)
nr. weeks worked$_{2007}$	42.9746	43.1425	-0.1679	(0.5392)

All estimates are based on the observed outcomes of workers that in 2003 were located in northern regions until they remain five or less years of potential labour market experience.

C Propensity score matching

In this section, we show the balancing properties of the variables and the findings obtained by implementing a propensity score matching procedure.

Table A3: Balancing before and after propensity score.

	Standardized Differences		Variance Ratios	
	Unmatched	Matched	Unmatched	Matched
Variables measured in $[2001, 2003]$				
Total nr. weeks worked	-0.1674	-0.0028	0.6965	0.9725
Injury rates (all injuries)	-0.1285	-0.0106	0.2571	1.1692
Injury rates (immediate care)	-0.0665	-0.0081	0.3347	0.8450
Injury rates (overtime & night)	-0.0543	0.0040	0.1890	1.0409
Total nr. of injuries (all injuries)	-0.2301	-0.0221	0.4136	0.8779
Total nr. of injuries (immediate care)	-0.1204	-0.0066	0.4658	0.9735
Total nr. of injuries (overtime & night)	-0.1010	-0.0122	0.4587	1.0640
Variables measured in 2003				
year of entry	0.3358	-0.0076	0.6168	0.8645
age	0.1956	-0.0038	1.0954	1.0062
log deflated wage	0.1874	-0.0225	0.7289	0.9919
log size	-0.3687	-0.0074	0.5226	0.8051
≤ 15 employees	0.3429	0.0158	0.7657	0.9815
Part time	0.1407	0.0077	1.3139	1.0131
Blue collar	0.1674	0.0000	0.4842	1.0000
Nr. weeks worked	0.1945	0.0043	0.8552	0.9738
Episodes of self employment	0.0193	-0.0174	1.1566	0.8850
ATECO 2007/NACE Rev. 2				
CB, textiles, apparel, leather etc.	-0.3392	-0.0219	0.1281	0.8083
CC, wood and paper products, and printing	-0.0261	0.0055	0.8692	1.0317
CH, basic metals and fabricated metal prod	-0.0378	0.0135	0.8538	1.0624
CK, machinery and equipment	0.0184	-0.0080	1.1442	0.9460
CL, transport equipment	-0.0715	-0.0029	0.4068	0.9567
CM, repair and install. mach. and equip.	-0.0507	0.0233	0.8827	1.0638
F,Construction	0.3794	0.0174	1.0545	0.9962
G, Wholesale,retail trade, repair of motor etc.	-0.0070	-0.0112	0.9779	0.9648
H,Transportation and storage	0.0060	-0.0254	1.0178	0.9312
N, Administrative and support service act.	-0.2719	0.0018	0.4160	1.0076
Italian regions (grouped)				
Basilicata and Calabria	-0.0047	0.0099	0.9535	1.1101
Campania	-0.1562	-0.0036	0.3229	0.9665
Emilia Romagna	-0.2862	-0.0008	0.4278	0.9967
Friuli Venezia Giulia	-0.0207	0.0013	0.8724	1.0091
Lazio	0.6597	-0.0164	5.7652	0.9820
Liguria	-0.1378	0.0058	0.3447	1.0606
Lombardia	-0.2960	-0.0252	0.6822	0.9581
Marche	-0.0768	0.0090	0.6400	1.0617
Molise	0.0344	-0.0192	2.2482	0.7151
Piemonte e Val d'Aosta	0.2671	0.0118	1.8733	1.0213
Puglia	-0.0501	0.0187	0.5943	1.2648
Sardegna and Sicilia	-0.0541	0.0025	0.5329	1.0355
Toscana	-0.0758	0.0074	0.7855	1.0262
Trentino Alto Adige	-0.0467	0.0052	0.6820	1.0486
Umbria	0.0026	-0.0052	1.0182	0.9650
Veneto	-0.0338	0.0134	0.9387	1.0268
Additional variables to improve balancing				
≤ 15 empl.$\times$ total nr. injuries (all)	-0.1123	-0.0285	0.5191	0.8771
≤ 15 empl.$\times$ injury rate (all)	-0.0531	-0.0145	0.6514	1.1867
N. observations	39112	5429	39112	5429

The table reports, for the unmatched and matched sample, the standardized differences and the variance ratios for the variables used in the propensity score matching (one match per observation). The first variables are computed in the interval $[2001, 2003]$. The remaining ones are computed in 2003.

Table A4: Propensity score matching: treatment effects on wages and injuries.

	Mean Treated	Mean Controls	Difference	A.I. Standard errors
		Log deflated wage		
log wage_{2004}	5.5778	5.5496	0.0283***	(0.0065)
log wage_{2005}	5.5681	5.5399	0.0282***	(0.0073)
log wage_{2006}	5.6169	5.5716	0.0452***	(0.0073)
log wage_{2007}	5.6378	5.5828	0.0550***	(0.0081)
		Injury rates: All injuries		
injury rate_{2004}	0.0657	0.0954	-0.0297***	(0.0112)
injury rate_{2005}	0.0555	0.0895	-0.0340***	(0.0090)
injury rate_{2006}	0.0565	0.0787	-0.0222***	(0.0084)
injury rate_{2007}	0.0458	0.0979	-0.0521***	(0.0132)
		Injury rates: Light injuries		
injury rate_{2004}	0.0416	0.0612	-0.0196**	(0.0083)
injury rate_{2005}	0.0366	0.0557	-0.0191***	(0.0066)
injury rate_{2006}	0.0357	0.0546	-0.0189***	(0.0067)
injury rate_{2007}	0.0297	0.0723	-0.0426***	(0.0117)
		Injury rates: Immediate care injuries		
injury rate_{2004}	0.0241	0.0342	-0.0101	(0.0075)
injury rate_{2005}	0.0189	0.0337	-0.0148**	(0.0061)
injury rate_{2006}	0.0208	0.0241	-0.0033	(0.0051)
injury rate_{2007}	0.0161	0.0256	-0.0095	(0.0060)
		Injury rates: Overtime & night injuries		
injury rate_{2004}	0.0131	0.0284	-0.0152**	(0.0069)
injury rate_{2005}	0.0184	0.0233	-0.0049	(0.0068)
injury rate_{2006}	0.0188	0.0242	-0.0054	(0.0063)
injury rate_{2007}	0.0160	0.0367	-0.0207*	(0.0109)
		Aggr. injury rate 2004-2006		
All injuries	0.0588	0.0812	-0.0224***	(0.0062)
Light injuries	0.0382	0.0533	-0.0151***	(0.0050)
Immediate care injuries	0.0207	0.0279	-0.0073**	(0.0036)
Overtime & night injuries	0.0155	0.0233	-0.0078**	(0.0033)

All estimates are based on the observed outcomed of workers until they have five or less years of potential labour market experience. The number of observations used to estimate the effects in 2004, 2005, 2006, 2007 and in the period 2004-2006 is respectively equal to 9584, 8314, 7102, 6086, 9964.

Table A5: Propensity score matching: treatment effects on various outcomes.

	Mean Treated	Mean Controls	Difference	A.I. Standard errors
Probability of self-employment				
pr. self-employment$_{2004}$	0.0363	0.0250	0.0113***	(0.0036)
pr. self-employment$_{2005}$	0.0378	0.0346	0.0031	(0.0048)
pr. self-employment$_{2006}$	0.0406	0.0411	-0.0006	(0.0056)
pr. self-employment$_{2007}$	0.0483	0.0430	0.0053	(0.0067)
episodes self.empl. $_{[2004-2006]}$	0.0875	0.0785	0.0091	(0.0085)
Probability of non-employment ($>$ 180 days)				
pr. non-employment$_{2004}$	0.1697	0.2233	-0.0536***	(0.0102)
pr. non-employment$_{2005}$	0.1727	0.2016	-0.0289***	(0.0108)
pr. non-employment$_{2006}$	0.1422	0.1453	-0.0032	(0.0101)
pr. non-employment$_{2007}$	0.1702	0.1568	0.0135	(0.0119)
Number of weeks worked				
nr. weeks worked$_{2004}$	40.1137	38.2364	1.8793***	(0.3657)
nr. weeks worked$_{2005}$	41.0873	39.3476	1.7397***	(0.4157)
nr. weeks worked$_{2006}$	40.9282	40.3070	0.6271	(0.4351)
nr. weeks worked$_{2007}$	41.4696	40.7956	0.6756	(0.4900)
Probability of job-to-job transition				
job-to-job$_{2004}$	0.0207	0.0198	0.0007	(0.0033)
job-to-job$_{2005}$	0.0200	0.0202	-0.0002	(0.0037)
job-to-job$_{2006}$	0.0231	0.0239	-0.0008	(0.0042)
job-to-job$_{2007}$	0.0194	0.0223	-0.0030	(0.0045)
Attrition: exit from dataset				
exit$_{2004}$	0.0253	0.0317	-0.0065	(0.0045)
exit$_{2005}$	0.0166	0.0289	-0.0123***	(0.0044)
exit$_{2006}$	0.0259	0.0177	0.0082**	(0.0042)
exit$_{2007}$	0.0460	0.0256	0.0204***	(0.0061)

All estimates are based on the observed outcomes of workers until they have five or less years of potential labour market experience. The number of observations used to estimate the effects in 2004, 2005, 2006, 2007 and in the period 2004-2006 is respectively equal to 9584, 8314, 7102, 6086, 9964.

C.1 Propensity score matching: Northern regions only

In this subsection we show additional estimates obtained from propensity score matching for migrants in the Northern regions only.

Table A6: Propensity score matching - Northern regions only: treatment effects on wages and injuries.

	Mean Treated	Mean Controls	Difference	A.I. Standard errors
		Log deflated wage		
log $wage_{2004}$	5.6054	5.5766	0.0288***	(0.0068)
log $wage_{2005}$	5.5968	5.5508	0.0460***	(0.0085)
log $wage_{2006}$	5.6413	5.5913	0.0500***	(0.0093)
log $wage_{2007}$	5.6617	5.6030	0.0586***	(0.0100)
		All injuries		
Injury $rate_{2004}$	0.0730	0.1033	-0.0304**	(0.0126)
Injury $rate_{2005}$	0.0672	0.0927	-0.0255**	(0.0122)
Injury $rate_{2006}$	0.0664	0.0914	-0.0251	(0.0168)
Injury $rate_{2007}$	0.0508	0.0991	-0.0483**	(0.0228)
		Light injuries		
Injury $rate_{2004}$	0.0479	0.0734	-0.0255**	(0.0113)
Injury $rate_{2005}$	0.0440	0.0652	-0.0212**	(0.0105)
Injury $rate_{2006}$	0.0428	0.0677	-0.0249	(0.0157)
Injury $rate_{2007}$	0.0325	0.0600	-0.0275**	(0.0115)
		Immediate care injuries		
Injury $rate_{2004}$	0.0250	0.0299	-0.0049	(0.0058)
Injury $rate_{2005}$	0.0232	0.0275	-0.0043	(0.0062)
Injury $rate_{2006}$	0.0236	0.0238	-0.0002	(0.0059)
Injury $rate_{2007}$	0.0183	0.0391	-0.0208	(0.0197)
		Overnight & night injuries		
Injury $rate_{2004}$	0.0173	0.0320	-0.0147*	(0.0083)
Injury $rate_{2005}$	0.0218	0.0277	-0.0059	(0.0082)
Injury $rate_{2006}$	0.0144	0.0217	-0.0073	(0.0071)
Injury $rate_{2007}$	0.0175	0.0259	-0.0084	(0.0080)
		Aggr. Injury rates 2004-2006		
All injuries	0.0674	0.0951	-0.0276***	(0.0070)
Light injuries	0.0439	0.0634	-0.0195***	(0.0059)
Immediate care injuries	0.0236	0.0317	-0.0081**	(0.0037)
Overnight & night injuries	0.0168	0.0278	-0.0110**	(0.0045)

All estimates are based on the observed outcomes of workers that in 2003 were located in northern regions until they remain five or less years of potential labour market experience.

Table A7: Propensity score matching - Northern regions only: treatment effects on other outcomes.

	Mean Treated	Mean Controls	Difference	A.I. Standard errors
Probability of self-employment				
pr. self-employment$_{2004}$	0.0438	0.0217	0.0221***	(0.0049)
pr. self-employment$_{2005}$	0.0455	0.0373	0.0082	(0.0066)
pr. self-employment$_{2006}$	0.0420	0.0347	0.0073	(0.0068)
pr. self-employment$_{2007}$	0.0554	0.0490	0.0063	(0.0088)
episodes self empl.$_{[2004-2006]}$	0.1010	0.0850	0.0160*	(0.0090)
Probability of non-employment (> 180 days)				
pr. non-employment$_{2004}$	0.1501	0.1806	-0.0305***	(0.0107)
pr. non-employment$_{2005}$	0.1453	0.1978	-0.0525***	(0.0115)
pr. non-employment$_{2005}$	0.1249	0.1327	-0.0078	(0.0117)
pr. non-employment$_{2007}$	0.1633	0.1373	0.0260*	(0.0133)
Number of weeks worked				
nr. weeks worked$_{2004}$	42.0161	40.6381	1.3780***	(0.4063)
nr. weeks worked$_{2005}$	43.2405	40.5121	2.7284***	(0.4683)
nr. weeks worked$_{2006}$	42.6881	41.5774	1.1108**	(0.4970)
nr. weeks worked$_{2007}$	42.9746	42.7657	0.2089	(0.5705)
Probability of job-to-job transition				
job-to-job$_{2004}$	0.0217	0.0231	-0.0014	(0.0043)
job-to-job$_{2005}$	0.0193	0.0328	-0.0135***	(0.0051)
job-to-job$_{2006}$	0.0229	0.0307	-0.0078	(0.0060)
job-to-job$_{2007}$	0.0190	0.0300	-0.0110*	(0.0059)
Attrition: exit from dataset				
exit$_{2004}$	0.0231	0.0235	-0.0004	(0.0043)
exit$_{2005}$	0.0111	0.0267	-0.0156***	(0.0043)
exit$_{2006}$	0.0249	0.0161	0.0088*	(0.0051)
exit$_{2007}$	0.0456	0.0156	0.0300***	(0.0064)

All estimates are based on the observed outcomes of workers that in 2003 were located in northern regions until they remain five or less years of potential labour market experience.