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ABSTRACT

From Refugees to Citizens: Labor Market Returns to Naturalization*

Is naturalization an effective tool to boost refugees' labor market integration? We address this novel empirical question by exploring survey data from 21 European countries and leveraging variation in citizenship laws across countries, time, and migrant groups as a source of exogenous variation in the probability of naturalization. We find that obtaining citizen status allows refugees to close their gaps in labor market outcomes relative to non-refugee migrants while having non-significant effects on the latter group. We then further explore the heterogeneity of returns to citizenship in a Marginal Treatment Effect framework, showing that migrants with the lowest propensity to naturalize would benefit the most if they did. This reverse selection on gains can be explained by policy features that make it harder for more vulnerable migrant groups to obtain citizenship, suggesting that a relaxation of eligibility constraints would yield benefits for both migrants and host societies.

JEL Classification: J15, J61, F22

Keywords: forced migration, citizenship, asylum policy

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1 Introduction

Forced migrants are a notably vulnerable population, exhibiting weaker economic integration compared to other migrant groups in most host countries (Becker & Ferrara 2019, Brell et al. 2020). In Europe, refugees are substantially less likely to be employed and to participate in the labor market relative to migrants with similar individual characteristics; these gaps are persistent and may take up to 15 years after their arrival to fully close (Fasani et al. 2022). Refugees' challenges in accessing host countries' labor markets can be primarily attributed to the traumatic experiences that compelled them to leave their home countries and to the sudden and unplanned nature of their migratory journeys. These factors underscore the need for policy interventions aimed at assisting forced migrants in their recovery and fostering their integration into host societies.

While the policy debate in receiving countries is often dominated by the quest for short-term and emergency measures to address temporary surges in asylum applications, it is crucial to recognize that medium and long-term interventions are equally significant. We adopt a long-run perspective in this study and assess, for the first time in the literature, the potential of naturalization as a driver of refugee integration. Our analysis bridges two seemingly distant areas of migration policy: asylum regimes and naturalization laws. Our empirical analysis revolves around a fundamental question: Does acquiring citizenship have a causal impact on the labor market outcomes of refugees, and does this impact differ from the effects of naturalization for comparable non-refugee migrants? More generally, we investigate whether naturalization benefits the most foreign-born citizens who struggle to integrate and, therefore, to naturalize. If naturalization effectively facilitates labor market integration, host countries may deliberately employ it as a tool to enhance the economic and overall inclusion of specific migrant groups, particularly those facing greater challenges, such as forced migrants. This question carries significant policy implications but still lacks an unambiguous empirical answer.

Citizenship is a constitutive element of a political community. Naturalization serves as the mechanism through which individuals who were not granted citizenship at birth gain access to membership within a specific polity (see Vink 2017 and Amuedo-Dorantes et al. 2020 for a discussion, and Goodman 2023 for a recent extensive review). Hosting countries face a clear trade-off when determining their citizenship requirements. On the one hand, if obtaining citizenship is desirable for migrants, delaying access and imposing stringent eligibility

criteria to "crown" only those who successfully integrate may create strong incentives for all migrants to exert (even) more effort in assimilating into the host societies (Hainmueller et al. 2017). This positive effect on migrants' behavior applies to all those interested in acquiring citizenship, potentially extending well beyond the subset of individuals who eventually naturalize. If these effects are sizable and widespread among the migrant population, there may be a strong rationale for rationing access to citizenship and setting strict eligibility criteria. Nevertheless, these criteria should not be perceived as unattainable by individuals, especially by the most disadvantaged groups, as this could potentially discourage their integration efforts (Arendt et al. 2023, Fouka 2023). On the other hand, if naturalization acts as a "catalyst" for integration (Hainmueller et al. 2017), leading to improved labor market outcomes for treated immigrants, there may be important losses associated with restrictive citizenship requirements. These costs may manifest as delayed integration and missed earnings potential, resulting in higher welfare spending and reduced tax revenues for the hosting country. The existence of these costs calls for a relaxation of citizenship criteria to allow migrants to naturalize earlier and in greater numbers. Any well-designed citizenship regime should thus carefully weigh potential incentive effects generated by the "crown effect" when access is restricted, against potential gains in integration "catalyzed" by naturalization when access is expanded.[1]

Whereas becoming a host country citizen determines the immediate acquisition of important legal rights and entitlements – such as unrestricted residency, mobility and voting rights – its impact on migrants' economic outcomes is debated and needs to be empirically quantified. The literature has pointed at several potential channels that may explain a causal impact of citizenship on immigrants' economic outcomes (see Gathmann & Garbers (2023) for a discussion). First, immigrants may gain access to a broader range of occupations, including higher-paying jobs with increased career prospects (Bratsberg et al. 2002, Gathmann & Keller 2018). Second, the acquisition of citizenship can lead to changes in the attitudes of both immigrants and native-born individuals. Immigrants may develop a stronger sense of belonging to the host country (Avitabile et al. 2013, Felfe et al. 2021), while natives may adopt more welcoming and non-discriminatory behavior (Hainmueller et al. 2019). Third, obtaining citizenship may reduce the intention to return to the home country and alter the perception of migrants' presence as temporary in the host country. This, in turn, can en-

[1]See Bertocchi & Strozzi (2010) for an analysis of the political economy of the determinants and evolution of citizenship laws.

courage long-term investments in host country-specific human capital, such as language skills (Adda et al. 2022). These investments can also impact the children of migrants, leading to positive spillover effects on second-generation immigrants (Avitabile et al. 2014, Felfe et al. 2020). One potential counter-balancing effect, however, may also be in place. Naturalized migrants may now have greater ease in traveling to and spending time in their country of origin without the risk of being denied re-entry to their host country. This increased mobility might weaken their attachment to the labor market, ultimately resulting in less favorable labor market outcomes (Bratsberg & Raaum 2011). In principle, the aforementioned mechanisms apply equally to refugees and non-refugee immigrants. However, given that refugees typically face greater disadvantages in European labor markets than non-refugees, they may have more significant potential for improvement in their labor market conditions following naturalization than their non-refugee counterparts.

Selection on both the supply and the demand sides of the naturalization process poses a serious empirical challenge in identifying its causal effect. On the supply side, the rationing of naturalization based on economic, language, and civic requirements aims to generate positive selection into naturalization. On the demand side, non-citizens who opt for naturalization might do so because they anticipate higher labor market returns from this decision, experience particularly poor outcomes without citizenship, possess a stronger attachment to the host country or harbor greater uncertainty about their prospects of continued residence in the future. These underlying motivations may generate correlations between migrants' socioeconomic outcomes and their citizenship status, but this does not necessarily prove the existence of a causal relationship.

In this paper, we contrast, for the first time, the effect of naturalization on labor market outcomes of refugees and other migrants. We do so using the latest available survey data, covering years until 2021, for 21 European countries matched with detailed information about citizenship regimes across countries and their evolution over time. We deal with endogenous selection into naturalization by leveraging exogenous variation (across countries, time, and migrant groups) in citizenship regimes and instrumenting citizenship status with a predicted measure of years since eligibility. This variable is constructed by matching each migrant in the sample with information on minimum residence requirements based on their host country, arrival cohort, and migrant group at arrival. OLS and IV estimates lead to very similar conclusions. First, we ascertain that the returns from naturalization for refugees are substantial, fully offsetting their gaps in labor market outcomes relative to other

migrants. Second, the return to citizenship acquisition for non-refugees is not significantly different from zero. These results apply to both the extensive margin of employment and participation and the quality of foreign-born workers' jobs. We further explore the impact of naturalization on labor market outcomes by studying heterogeneity along unobservable dimensions through a Marginal Treatment Effects (MTE) approach. The MTE profiles we estimate point to highly heterogeneous returns, suggesting that individuals with higher resistance to naturalization also display higher potential returns from it. Returns from naturalization, indeed, are estimated to be zero for "treated" individuals (ATT), while they would be positive and statistically significant for "untreated" ones (ATUT).[2]

Our study contributes to two main strands of the literature. First, we provide novel empirical evidence to the body of research exploring the impact of naturalization on immigrants' labor market outcomes. Early studies in this literature relied on cross-sectional data and compared outcomes of naturalized and non-naturalized immigrants, generally pointing at the former having better outcomes than the latter. These positive gaps, however, could be entirely driven by positive selection into naturalization. Subsequent studies (Bratsberg et al. 2002, Steinhardt 2012, Helgertz et al. 2014) utilized longitudinal data to attempt to disentangle the effects of selection from the causal impact of acquiring citizenship. More recently, researchers have leveraged reforms of national citizenship laws to obtain exogenous variation in the probability of naturalization and thus identify causal parameters.[3] In Germany, Gathmann & Keller (2018) exploited two reductions of residency requirement duration to show that faster access to citizenship improves immigrants' labor market attachment. In a related study, Gathmann et al. (2021) demonstrated that citizenship significantly improved the school performance of immigrant children in Germany. In Switzerland, individual naturalization referenda held in some municipalities allowed comparing applicants who were barely successful with applicants who narrowly lost in a regression discontinuity design framework, showing that citizenship fostered political integration (Hainmueller et al. 2015), social integration (Hainmueller et al. 2017) and long term labor market outcomes of immigrants (Hainmueller et al. 2019). In France, Govind (2021) exploits a doubling of residency requirements for naturalization through marriage to show that citizenship signifi-

[2]The reverse selection on gains we document for labor market returns of naturalization aligns with the one estimated by Gathmann et al. (2021) for educational returns of immigrant children in Germany.

[3]A closely related, although distinct, literature has looked at the effects of introducing birthright citizenship on young migrants' behavior (Felfe et al. 2020, 2021) and on migrant parents' outcomes and choices (Avitabile et al. 2014, 2013). Amuedo-Dorantes et al. (2017), instead, analyze the effect of a policy limiting birthright citizenship in the Dominican Republic.

cantly increases immigrants' earnings. In a related paper, Govind & Sirugue (2023) leverage the drop in naturalization costs for second-generation immigrant men driven by the reform of compulsory military conscription to show that acquisition of French citizenship leads to an increase in their employment probability. In contrast to these European studies, a recent analysis that exploits the randomization of naturalization fee vouchers among low-income foreign residents in New York fails instead to find significant effects of naturalization on any socio-economic outcomes (Hainmueller et al. 2023). While most studies conclude that naturalization can yield significant improvements for certain individuals, they often reveal that the effects are negligible for others. Gathmann & Keller (2018) found no employment effects for men but observed positive impacts for women. Similarly, more marginalized groups of immigrants in Switzerland have been shown to experience more substantial returns from naturalization, not only in terms of social integration (Hainmueller et al. 2017) but also in their labor market outcomes (Hainmueller et al. 2019). This heterogeneity suggests that there may be no economic returns to citizenship for migrant groups with a continuous work history and permanent work permits, while positive returns are to be expected for those with a weaker labor market attachment. We contribute to this body of evidence by focusing our analysis on the heterogeneity of labor market returns to citizenship. We first document large differences in returns for refugees and economic migrants, and then estimate heterogeneous profiles along unobservable dimensions in our Marginal Treatment Effects analysis. Both sets of results are new in this literature.

A second important contribution of our work lies in expanding the literature on policies designed to integrate refugees into host societies with the analysis of a yet unexplored policy tool: naturalization. The literature has so far studied the impact of asylum policies implemented soon after arrival, focusing on geographic dispersal policies (Edin et al. 2004, Bansak et al. 2018, Fasani et al. 2022), the speed of asylum application processing (Hainmueller et al. 2016, Hvidtfeldt et al. 2018), the generosity of income support for refugees (Rosholm & Vejlin 2010, Andersen et al. 2019, LoPalo 2019), language training, introduction programs and job search assistance (Clausen et al. 2009, Joona & Nekby 2012, Sarvimäki & Hämäläinen 2016, Battisti et al. 2019, Lochmann et al. 2019, Dahlberg et al. 2020, Qi et al. 2021, Foged et al. 2022, 2023), and restrictions to the employment of asylum seekers (Marbach et al. 2018, Fasani et al. 2021, Ahrens et al. 2023). To our knowledge, none has considered the role of naturalization policies in affecting refugees' outcomes in host countries. The findings in our paper strongly suggest that the access of refugees to host country citizenship may be

an extremely effective measure to foster their economic integration.

The paper is structured as follows. In the next section, we present the datasets we will use throughout the analysis and provide some stylized facts on citizenship acquisition and naturalization laws in Europe. Section 3 provides descriptive evidence of the correlation between labor market outcomes, citizenship, and refugee status. Section 4 describes the identification strategy we use to identify the causal effects of naturalization. We present our main results in Section 5 and discuss some additional findings in Section 6. Section 7 investigates the heterogeneity of the effects through the estimation of Marginal Treatment Effects (MTE). Section 8 concludes and draws some policy implications.

2 Data and Descriptive Evidence

Our analysis relies on the latest available wave (2021) of the European Labor Force Survey (EULFS), as well as on two earlier waves (2008 and 2014). This dataset provides comprehensive information regarding refugee status, naturalization, and the labor market integration of migrant workers in European countries (see sections 2.1 and 2.2). Individual records from the EULFS are then matched with data on eligibility criteria for naturalization at the time of migrants' arrival in the host countries. We collected this information for each EU country and organized it in a novel database on citizenship laws in Europe (see section 2.3).

2.1 EULFS

The EULFS is a large household survey of people aged 15 and over, covering the Member States of the European Union, the candidate countries, and two countries of the European Free Trade Association (EFTA). The EULFS contains standard demographics – including country of birth, country of citizenship, and, for immigrants, years since migration – as well as detailed information on respondents' labor market outcomes. Additionally, the modules on the labor market situation of migrants conducted in 2008, 2014, and 2021 contain information about the main reason for migration to Europe, which allows us to distinguish individuals who entered the country to seek asylum from other migrants. The reason–for–migration question was asked to all non-native individuals who arrived in the country of residence when they were over 16. Using this question, we define as "refugees" all the respondents stating that their main reason for migrating to Europe was seeking humanitarian protection, and as

"other migrants" all foreign-born respondents who selected any other reasons (study, work, family reunification, etc.). Note that our definition of refugees does not refer to the *current* visa status of individuals (which is irrelevant for our purpose since naturalized migrants no longer hold residence permits), nor their residence status at entry, but encompasses any migrant who resides in Europe and has a forced migration background. Hence, this definition allows us to measure the outcomes of a representative sample of the full population that sought asylum in Europe over the last few decades, and not just those of the selected sub-sample who successfully obtained refugee status.[4]

Our sample includes all working-age individuals (aged 20-64), born outside of the EU, North America, or Oceania, who are not in full-time education or military service and for whom we have information on the main reason for migration. We trim individuals who report an extremely long residence in Europe (i.e., 45 years or more) from the sample. Additionally, we retain only country-year pairs with at least twenty refugees among the respondents. The modules on the labor market situation of migrants are not available for all countries in all three years (see Appendix Table A.1 the distribution of observations in our sample by host country and survey year). Our final estimating sample covers 21 countries and comprises 131,670 individuals: 13,997 refugees and 117,673 non-refugees.

2.2 Descriptive Statistics

Table 1 reports summary statistics for our sample. It shows that there are fewer women among refugees compared to other migrants (39% vs. 53%) and that the age distributions of refugees and non-refugees are similar, although refugees tend to be slightly older: 29% of refugees are in the age bracket 50–64, versus 25% of non-refugees. Refugees also tend to have slightly lower education levels than non-refugees: They are more likely to have at most primary education (44% vs. 40%) and less likely to have completed tertiary education (22% vs. 28%). Areas of origin are also somewhat different between the two groups. While 24% of refugees come from European countries outside of the EU and an additional 37% from North Africa and the Middle East, the corresponding figures among other migrants are

[4]In previous research (Fasani et al. 2021, 2022), we have shown that arriving as a forced migrant in Europe - as measured in the EULFS data - predicts markedly different outcomes and responses to asylum policy relative to other migrants even 10-15 years after arrival, implying that the question on reason-for-migration allows to identify a relevant sub-population of interest. Further, in Appendix Section A.3, we validate our estimates of the refugee population from the EULFS against records from UNHCR (the UN Refugee Agency), supporting the reliability of the "reason–for–migration" question as a way to identify refugees correctly.

27% and 24%. Furthermore, 18% of refugees originate from Sub-Saharan Africa, compared to only 13% of other migrants. Finally, 19% and 18% of other migrants originate from East or South Asia or Latin American countries, respectively, as opposed to 16% and 5% of refugees. In terms of time spent in the host country, while the share of recent arrivals (i.e., less than five years since migration) is similar for both groups (11% and 12%), the percentage of refugees with 5 to 9 years since migration (31%) is considerably higher than among other migrants (18%). Conversely, the fraction of non-refugees who have been in the current country for 10 to 19 years is higher (35%) than for refugees (26%).[5] The bottom rows of Table 1 reveal that refugees have a higher probability of holding citizenship of the host country than non-refugees (45% vs. 40%) but also that their employment probability is lower (58% vs. 65%).

In Figure 1, we delve deeper into the differences between refugees and other migrants in their labor market integration and access to host country citizenship. The left panel of the Figure displays the estimated refugee-migrant gaps in employment probability when comparing them within the same host country and year (*baseline* gaps, lighter bars), and when, in addition, we control for individual characteristics such as gender, age, education, area of origin and years of residence (*conditional* gaps, darker bars). The right panel replicates this exercise, focusing on gaps in the probability of naturalization. In both panels we distinguish between immigrants who have been in the host country for less than ten years (purple bars) and those with longer residence (green bars). The Figure highlights a considerable disadvantage in the employment probability of refugees with less than ten years of seniority in the host country, even when compared to migrants with similar characteristics. The gap decreases substantially for those with more than ten years of residence but remains negative and precisely measured. In contrast, the right panel indicates minimal differences in the probability of naturalization between refugees and migrants with less than ten years of residence. However, the conditional naturalization gap turns positive and statistically significant at conventional levels for refugees with longer periods of residence. These estimates suggest that refugees persistently lag in their labor market integration relative to other migrants. At the same time, they are more likely to naturalize relative to other migrants with similar characteristics, provided they have spent enough time in the host country. Appendix Figures A.3 and A.4 point to a similar pattern by displaying variation across host countries

[5]Note that, in the EULFS, the information about years since arrival in the host country is collected in one-year intervals until ten years of residence and in five-year intervals thereafter.

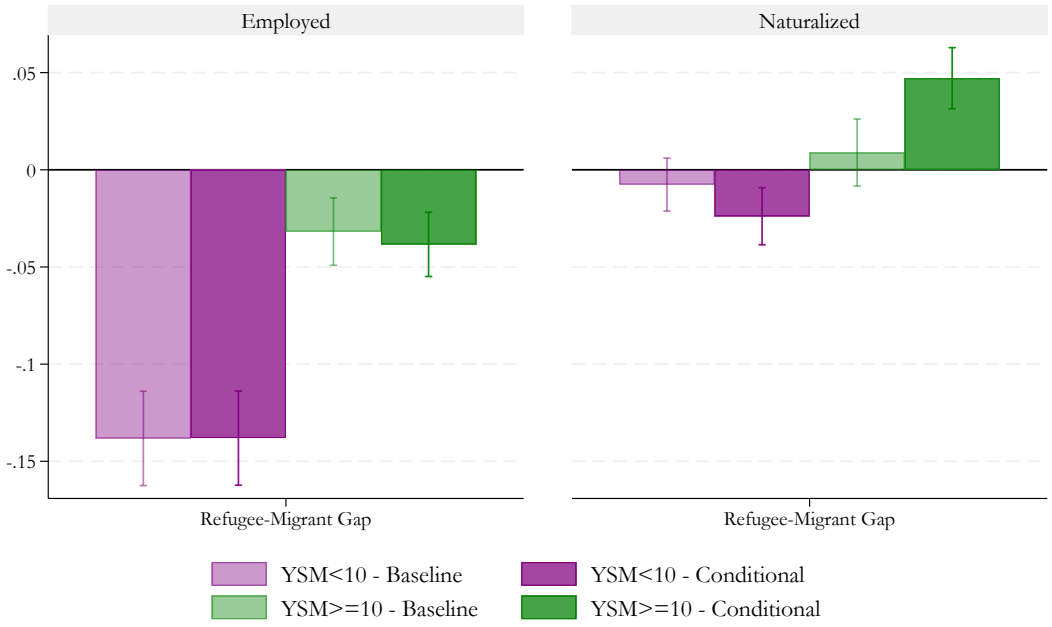
in the shares of employed and naturalized refugees and migrants.

Table 1: Summary statistics

	Refugees		**Other Immigrants**	
	Mean	SD	Mean	SD
Gender:				
Female	0.39	(0.49)	0.53	(0.50)
Age:				
20-29	0.15	(0.35)	0.15	(0.36)
30-39	0.29	(0.45)	0.31	(0.46)
40-49	0.28	(0.45)	0.29	(0.45)
50-64	0.29	(0.45)	0.25	(0.43)
Education:				
Primary Education	0.44	(0.50)	0.40	(0.49)
Secondary Education	0.34	(0.47)	0.33	(0.47)
Tertiary Education	0.22	(0.42)	0.28	(0.45)
Origin:				
Other Europe	0.24	(0.43)	0.27	(0.44)
North Africa and Middle East	0.37	(0.48)	0.24	(0.43)
Other Africa	0.18	(0.38)	0.13	(0.34)
East and South Asia	0.16	(0.37)	0.19	(0.39)
Latin America	0.05	(0.23)	0.18	(0.38)
YSM:				
less than 5	0.11	(0.31)	0.12	(0.32)
5-9	0.31	(0.46)	0.18	(0.39)
10-19	0.26	(0.44)	0.35	(0.48)
20-29	0.23	(0.42)	0.21	(0.41)
30-44	0.09	(0.29)	0.14	(0.35)
Survey year:				
2008	0.16	(0.36)	0.15	(0.36)
2014	0.23	(0.42)	0.35	(0.48)
2021	0.61	(0.49)	0.50	(0.50)
Outcomes:				
Naturalized	0.45	(0.50)	0.40	(0.49)
Employed	0.58	(0.49)	0.65	(0.48)
N	13,997		117,673	

Note: The table reports the mean and standard deviation of selected characteristics of our sample, corresponding to all the control variables used in our analysis and two key outcomes, broken down by refugees and non-refugees. Female is a dummy variable for women. *Age*: dummies for age groups 20–29, 30–39, 40–49, 50–64. *Education*: three dummies indicating individuals who have achieved at most primary, upper secondary, or tertiary education. *Origin*: dummies for five macro-areas of origin. *YSM*: dummies that denote the time spent in the host country. *Survey year*: dummies indicating the year to which the observation refers. *Outcomes* are a dummy for citizenship of the host country and a dummy for employment. Sample: working-age individuals born outside of the EU, North America, or Oceania, who have been in the current country for no more than 44 years and not in full-time education or military service. Data: EULFS module on the labor market situation of migrants and their immediate descendants, 2008, 2014, and 2021.

Figure 1: Refugee-Migrant Gaps in Employment and Naturalization



Note: The figure reports baseline (controlling only for the interaction of host country and interview year dummies) and conditional (also controlling for gender, age, education, years of residence, and area of origin) estimates of the refugee-migrants difference in employment (left panel) and in naturalization (right panel) probability, together with their associated 95% confidence intervals. Data: EULFS module on the labor market situation of migrants and their immediate descendants, 2008, 2014, and 2021.

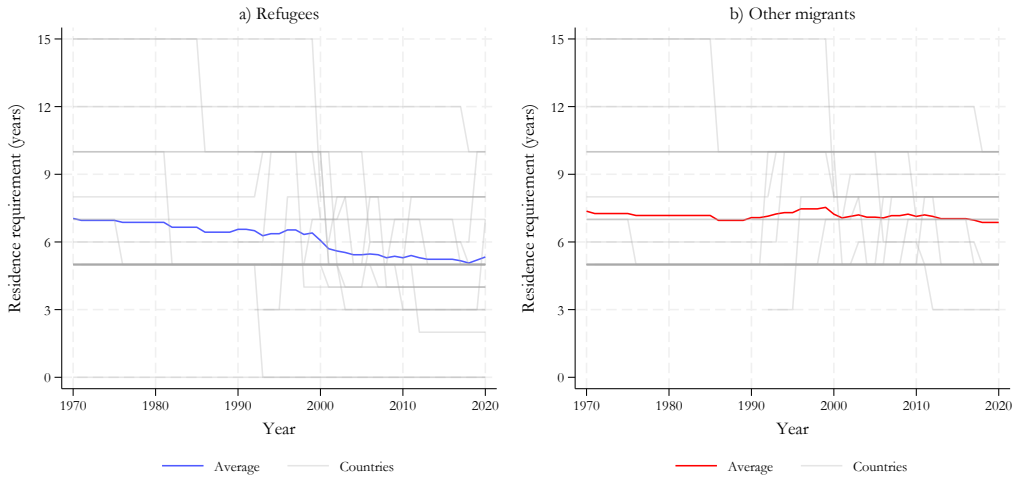
2.3 Citizenship Laws Database

We constructed a dataset of naturalization requirements in place in European countries between 1964 and 2020 based on information retrieved from the GLOBALCIT Citizenship Law Dataset v1.0 (Vink et al. 2021), from the Global Databases on Modes of Acquisition and Loss of Citizenship (Vink & Vonk 2021) and from the country reports of the Global Citizenship Observatory.[6] The GLOBALCIT Citizenship Law Dataset v1.0 collects systematic information on 28 ways citizenship can be acquired and 15 ways citizenship can be lost for 190 countries in 2020. The Global Databases on Modes of Acquisition and Loss of Citizenship report the same type of information for 2013–2016 for countries in Europe and the Americas. For the years not covered in these sources, we gather information on requirements for naturalization from the country reports of the Global Citizenship Observatory. Specifically,

[6]Country reports are available for download from the Global Citizenship Observatory website: https://globalcit.eu/publications/, last accessed on May 10, 2023.

our database lists all requirements to apply for citizenship (minimum years of residency, language skills, knowledge of the host country, absence of criminal records, economic situation, and renunciation to the previous nationality) for each country and year, distinguishing between requirements for refugees and for other migrants in the frequent cases in which the two groups are subject to different rules. The database covers all years between 1964 and 2020 (the first and last year of arrival in the host country in our EULFS sample, respectively).[7]

Figure 2: Average residency requirements for naturalization



Note: The figure reports the evolution over time of the minimum years of residency requirement for refugees' (Panel a) and other migrants' (Panel b) eligibility for naturalization. Each light line refers to a different European country, whereas the darker lines report the mean value across all countries. Source: authors' elaborations on data from GLOBALCIT Citizenship Law Dataset, v1.0; Global Databases on Modes of Acquisition and Loss of Citizenship; country reports of the Global Citizenship Observatory.

One essential requirement for naturalization is that immigrants must have continuously resided for a minimum number of years in the country where they seek to acquire nationality. All countries enforce this requirement, which plays a crucial role in our analysis (see Section 4). Figure 2 illustrates how this residency requirement has evolved in European countries over time for refugees (Panel a) and for other migrants (Panel b). In each graph, the darker line indicates the average length of the residency requirement across all European countries in our sample. In contrast, the lighter grey lines depict country-specific variations in these requirements. The Figure highlights that, on average, refugees are subject to shorter residency requirements than other migrants. This more favorable treatment of refugees

[7]Note that we have missing information on Cyprus before 1967, on Greece before 1968, and on Croatia and Slovenia before 1992 (when they were still part of Yugoslavia).

becomes notably pronounced after 2000 when their average residency requirement falls below six years, whereas it remains above seven years for other migrants.[8]

Furthermore, Appendix Figure A.2 provides evidence on the share of countries imposing additional requirements for immigrants to become eligible for naturalization. Specifically, it presents, for each year and separately for refugees (Panel a) and other migrants (Panel b), the percentage of countries that impose requirements related to language fluency, knowledge of a country's history and institutions, economic self-sufficiency, the absence of criminal records, or the necessity to renounce their previous nationality. Notably, there is a discernible upward trend in the percentage of countries that impose additional requirements on citizenship applicants over time.

2.4 Naturalizations and Asylum Applications in Europe

The number of naturalizations and asylum applications are both on the rise in European countries. In 2021, over 827,000 individuals obtained citizenship in a European Union (EU) country, constituting a new citizen inflow equivalent to 2.2% of the total foreign resident population in the EU27.[9] This influx of new citizens has demonstrated consistent growth in recent years, with a 14% increase in 2021 compared to the previous year and a remarkable 36% surge when compared to the figures from a decade earlier in 2011. Notably, the majority of individuals who acquired citizenship in an EU Member State, approximately 85% in 2021, were previously citizens of a non-EU country residing within the respective Member State. Meanwhile, more than 537 thousand individuals applied for asylum in an EU country in 2021, adding to the 669 thousand asylum seekers and to the 2.8 million refugees who were already present in the EU.[10]

[8] In Appendix Figure A.1, we reproduce the same graph when the average value is weighted by the number of migrants included in our sample in each host country.

[9] Source: Eurostat migr_acq and migr_pop1ctz.

[10] Source: UNHCR.

3 Labor Market Returns of Naturalization: Descriptive Evidence

3.1 Estimating Equation

In this section, we examine the impact of naturalization on the labor market outcomes of migrants and assess whether the effect of acquiring citizenship differs between refugees and non-refugees. To investigate how citizenship acquisition influences the labor market integration of these two groups, we estimate the following Linear Probability Model:

$$y_i = \beta_0 + \beta_1 Naturalized_i + \beta_2 Refugee_i + \beta_3 Naturalized_i \times Refugee_i + X_i'\gamma + e_i \quad (1)$$

where: y_i is a dummy variable measuring the labor market outcome of interest for individual i, $Naturalized_i$ is a dummy variable equal to 1 if the respondent has naturalized, $Refugee_i$ is a dummy variable equal to 1 if the respondent is a refugee and 0 otherwise, and X_i is a vector of observable characteristics. In all specifications, we control for interview year-host country dummies to capture average differences across countries and survey waves, and we then gradually include a full set of dummies for age, gender, level of education, origin area, and years since arrival in the host country. Our analysis will first consider three complementary "extensive margin" labor market outcomes: being employed, active, or unemployed. In section 6 we will then analyze, for those in employment, different dimensions of job quality. In equation (1), the parameter β_1 indicates by how much the outcome of interest changes for migrants who have acquired citizenship relative to those who have not; β_2 measures the difference in that outcome between refugees and other migrants when they are not naturalized; and β_3 captures the additional effect that citizenship acquisition has for refugees relative to other migrants. The total impact of citizenship for refugees is thus given by $(\beta_1 + \beta_3)$.

3.2 OLS Estimates

Table 2 reports OLS estimates of different specifications of equation (1) when the dependent variable is a binary indicator for being employed. Column (1) – which does not include the $Refugee_i$ dummy, nor its interaction with $Naturalized_i$, and exclusively conditions on the interaction of year and host country dummies – shows that naturalized migrants have

a higher employment probability compared to non-citizen migrants. This "naturalization premium", captured by the coefficient β_1, is estimated to be 9.4 p.p. (or 14.7% relative to the baseline employment probability of 64% for non-naturalized migrants) when naturalized migrants are compared to other migrants who are observed in the same country and year. In column (2), the return from naturalization marginally decreases to 8.8 p.p. when we take into account differences in age, gender, education, and areas of origin between naturalized and non-naturalized migrants. However, a crucial factor influencing labor market integration is the duration of stay in the host country, which is also a significant predictor of naturalization. Therefore, the higher employment probability observed among naturalized migrants might simply result from the longer time spent in their current country of residence. Including a full set of years since migration dummies in column (3) allows us to compare naturalized migrants to other migrants who not only share the same individual characteristics and country of residence but have also spent the same amount of time in the host country. In this specification, the "naturalization premium" is reduced by half to 4.6 percentage points (or 7% relative to the baseline). In column (4), we add a refugee dummy, revealing that refugees have an 8.1 percentage point lower employment probability than non-refugees. Notably, this addition does not significantly affect the estimate of β_1. Finally, column (5) reports estimates from the full specification of equation (1), where returns to citizenship are allowed to differ between refugees and non-refugees. In this specification, the coefficient on the refugee dummy captures the difference in the employment probability between refugees and other migrants who have not naturalized. This gap is estimated to be almost 12 percentage points. Importantly, there are significant differences in the estimates of the naturalization premium between refugees and non-refugees. Citizenship of the host country is associated with a 3.9 p.p. higher employment probability among non-refugees. Conversely, this association is much stronger for refugees, with a further 8 percentage points increase. This means that the relationship between citizenship and employment probability is three times stronger for refugees than similar non-refugee migrants. These estimates thus imply that the employment probability gap between naturalized refugees and non-refugees is two-thirds smaller than the corresponding gap between non-naturalized refugees and non-refugees.

Table 2: Naturalization and Employment (OLS estimates)

	(1)	(2)	(3)	(4)	(5)
	Empl	Empl	Empl	Empl	Empl
VARIABLES	OLS	OLS	OLS	OLS	OLS
Naturalized	0.094***	0.088***	0.046***	0.047***	0.039***
	[0.005]	[0.005]	[0.005]	[0.005]	[0.006]
Refugee				-0.081***	-0.117***
				[0.007]	[0.010]
Naturalized x Refugee					0.080***
					[0.013]
Observations	131,670	131,670	131,670	131,670	131,670
Year x Host Country FE	Yes	Yes	Yes	Yes	Yes
Age Gender Education FE	No	Yes	Yes	Yes	Yes
Origin Area FE	No	Yes	Yes	Yes	Yes
YSM FE	No	No	Yes	Yes	Yes
Avg Out.: Non-Nat. Migrants			0.641		

Note: Each column reports results from separate OLS regressions of a dummy for employment on a dummy for being naturalized (columns 1-3), and additionally on a refugee dummy (column 4) as well as on the interaction of the "Naturalized" and the "Refugee" dummies (column 5). All regressions include the interaction of year and host country dummies ("Year x Host Country FE"). Columns (2)–(5) further include a set of dummies for five-year age brackets, female and primary, secondary, or tertiary education ("Age Gender Education FE") and dummies for macro-area of origin ("Origin area FE"). Columns (3)–(5) also include a set of dummies that identify each year since arrival in the host country until ten years of residence and five-year intervals thereafter ("YSM FE"). Robust standard errors are presented in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table 3 follows a structure similar to Table 2, but it reports results from regressions where the dependent variable is either a labor market participation dummy (columns (1) – (3)), or an unemployment dummy (i.e., a dummy that is equal to 1 for jobseekers and 0 for those in employment, but not defined for inactive individuals; columns (4) – (6)). All specifications include years since migration dummies. Results in this Table align with those observed for employment probability. The refugee gap is substantial but decreases to about one-third of its original size among those who have naturalized. Conversely, naturalization is associated with a threefold increase in labor market participation – or a corresponding reduction in the probability of unemployment – for refugees compared to other migrants.

Table 3: Naturalization, Labor Market Participation, and Unemployment (OLS estimates)

	(1)	(2)	(3)	(4)	(5)	(6)
	lmp	lmp	lmp	unempl	unempl	unempl
VARIABLES	OLS	OLS	OLS	OLS	OLS	OLS
Naturalized	0.034***	0.035***	0.028***	-0.023***	-0.023***	-0.019***
	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]
Refugee		-0.066***	-0.094***		0.034***	0.054***
		[0.006]	[0.009]		[0.006]	[0.010]
Naturalized x Refugee			0.063***			-0.042***
			[0.012]			[0.012]
Observations	131,670	131,670	131,670	99,291	99,291	99,291
Year x Host Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Age Gender Education FE	Yes	Yes	Yes	Yes	Yes	Yes
Origin Area FE	Yes	Yes	Yes	Yes	Yes	Yes
YSM FE	Yes	Yes	Yes	Yes	Yes	Yes
Avg Out.: Non-Nat. Migrants		0.741			0.134	

Note: Each column reports results from separate OLS regressions of a dummy for labor market participation (columns 1–3) or for unemployment (columns 4–6) on a dummy for being naturalized (columns 1 and 4), and additionally on a refugee dummy (columns 2 and 5) as well as on the interaction of the "Naturalized" and the "Refugee" dummies (columns 3 and 6). All regressions include "Year x Host Country FE", the interaction of year and host country dummies; "Age Gender Education FE", a set of dummies for five-year age brackets, female and primary, secondary or tertiary education; "Origin area FE", dummies for each macro-area of origin; "YSM FE", a set of dummies that identify each year since arrival in the host country until ten years of residence, and five-year intervals thereafter. Robust standard errors are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

4 Addressing Endogenous Selection into Naturalization

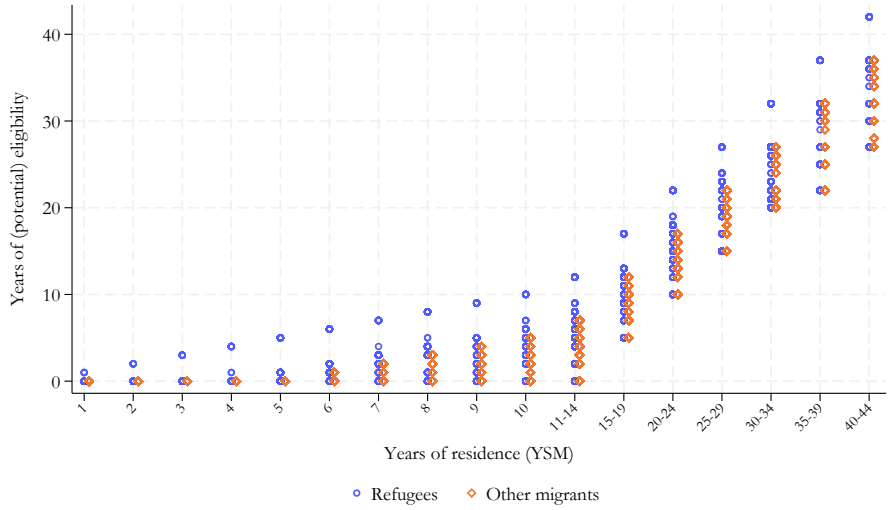
The decision to naturalize is not exogenously determined. Migrants who naturalize may be particularly determined to integrate into their new country, better informed about the bureaucratic procedures, or more able to fulfill the host country's language skills or knowledge requirements. Naturalized immigrants might thus have unobservable characteristics that make them more employable, generating an upward bias in the OLS estimates of β_1 and β_3 in equation (1). Conversely, migrants who face challenges in the host country labor market might have stronger incentives to naturalize. They could do so out of concern for the potential loss of their work-contingent residence permits or with the hope that acquiring

full political rights in their host country could mitigate the discrimination they experience. In this scenario, OLS estimates might be downward biased. In principle, both self-selection mechanisms could be at work, making it impossible to determine the direction of the bias *a priori*. To address this identification threat, we implement an instrumental variable approach.

Migrants can endogenously choose to naturalize, but only if they meet host countries' specific legislative requirements. Our proposed instrumental variable (IV) strategy thus leverages supply-side determinants of naturalization. In particular, our strategy relies on the fact that one necessary condition for naturalization in all countries is to satisfy a minimum residency requirement. Unlike other naturalization criteria, such as language fluency or economic self-sufficiency, which depend on migrants' actions, the minimum residency requirement cannot be manipulated by migrants, as it is automatically determined by their year of arrival in the country. Our approach is analogous to that used in other studies in the literature on citizenship, which relied on changes in eligibility rules for identification (Gathmann & Keller 2018, Gathmann et al. 2021, Govind 2021). However, unlike studies focusing on specific reforms in a single country, our approach relies on heterogeneous citizenship regimes that underwent multiple changes in eligibility rules over the period we analyzed. As discussed in section 2.3, EU member states' residency requirements exhibit substantial variation not only across countries and within countries over time, but also between refugees and non-refugees in the same country. More specifically, our IV strategy consists in instrumenting the endogenous naturalized status with a variable $Years\ of\ Eligibility_i$ that counts the number of years each migrant has been potentially eligible for naturalization at the moment of the interview (that is, the time elapsed since fulfilling the minimum residency requirement). We construct this variable by matching our sample respondents with naturalization requirements from our citizenship laws database (section 2.3), considering their host country, cohort of arrival, and migrant group (i.e., refugees or other migrants). We then compute the number of years since achieving eligibility based exclusively on the residence duration rule, setting the variable equal to zero if the migrant is not eligible yet (e.g., two years of potential eligibility for a migrant who arrived twelve years before the interview in a country requiring ten years of continuous residence, and zero years for any residence below ten years). Note that our instrument captures *potential eligibility* for naturalization at the time of the interview, which is exogenous, and not *actual eligibility*. Migrants' choices and behaviors endogenously determine the latter, which depends on whether the migrants satisfy

all the additional requirements for naturalization (income, language, culture, etc.) and can be achieved through other channels (such as marrying a native citizen).

Figure 3: Variation in (Potential) Eligibility and Years of Residence



Note: The figure reports the values that the variable *Years of Eligibility*, measuring the number of years since meeting the minimum residency requirements necessary for naturalization (vertical axis), takes in our sample within each group defined by years since migration (horizontal axis). Source: authors' elaborations from EULFS module on the labor market situation of migrants and their immediate descendants, 2008, 2014, and 2021.

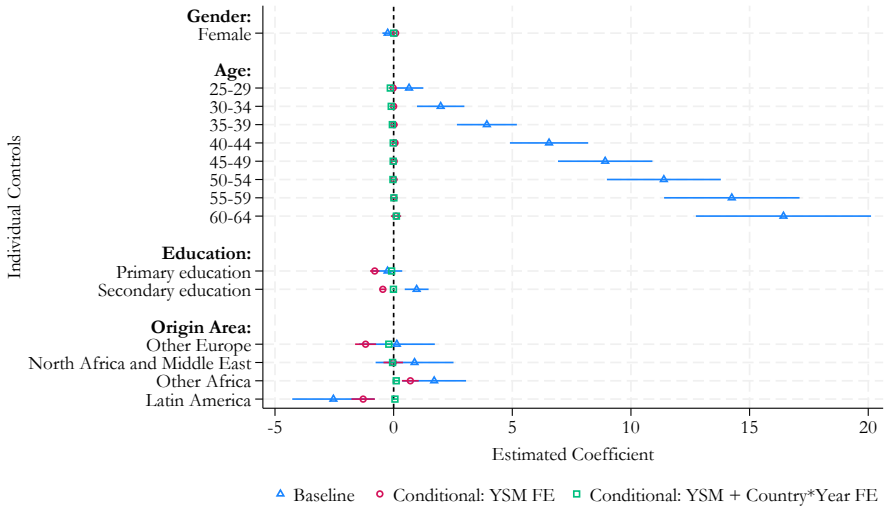
In our 2SLS regressions, we instrument the endogenous $Naturalized_i$ dummy with $Years\ of\ Eligibility_i$ and the interaction term $Naturalized_i \times Refugee_i$ with the interaction $Years\ of\ Eligibility_i \times Refugee_i$.[11] Our identifying assumption is that, conditional on all the regressors included in equation (1) – and, in particular, on the whole set of years since migration dummies – the number of years since meeting the minimum residency requirement for naturalization has no direct effect on labor market outcomes, i.e., it does not affect labor market outcomes in other ways than through increasing the probability of naturalization.

While conditioning on years since migration is crucial for a credible identification, one legitimate concern is that our instrumental variable does not exhibit sufficient variation within "years since migration" cells. We display such variation in Figure 3, which plots the values that the instrument *Years of Eligibility* can take (on the vertical axis) for each

[11]Note that the refugee status variable $Refugee_i$ is based on the reason for migration at the time of arrival in the host country and it is therefore predetermined with respect to labor market integration and naturalization choices.

value of years since migration (on the horizontal axis), distinguishing between refugees (blue circles) and other migrants (red diamonds). The Figure shows that *Years of Eligibility* indeed displays significant variation even within immigrants who have spent the same amount of time in the host country. This is the identifying variation that we will exploit in our estimates.

Figure 4: Balance Tests: Years of (Potential) Eligibility and Individual Characteristics



Note: The figure reports estimated coefficients (with 95% confidence intervals) from three different specifications of a regression of the variable *Years of Eligibility*, number of years since meeting the minimum residency requirements necessary for naturalization on the dummy variables reported on the vertical axis. Specifications: (i) "Baseline": no additional controls; (ii) "Conditional: YSM FE": including dummies identifying each year since arrival in the host country until ten years of residence, and five-year intervals thereafter; (iii) "Conditional: YSM + Country*Year FE": further including the interaction of year and host country dummies. Standard errors clustered at YSM-host country level (345 clusters): *** p<0.01, ** p<0.05, * p<0.1. Source: authors' elaborations from EULFS module on the labor market situation of migrants and their immediate descendants, 2008, 2014, and 2021.

The validity of our instrument requires that the number of years since eligibility is as good as randomly distributed across migrants, conditional on observed individual characteristics as well as on year-country dummies. While this assumption cannot be tested directly, we can support the instrument's validity by checking whether the variable *Years of Eligibility* correlates with individual characteristics. We regress *Years of Eligibility* on all individual characteristics (gender, age, education, and area of origin) that we use in our main empirical analysis and report these balance tests in Figure 4. We display estimated coefficients (with 95% confidence intervals) from three specifications. Blue triangles represent estimates when no additional controls are included. Notably, we observe several significant correla-

tions, particularly a strong age gradient, whereby older respondents have many more years of (potential) eligibility than younger ones. However, this age gradient is primarily driven by the longer residence duration of older migrants in host countries, which, in turn, determines longer predicted eligibility spells. Indeed, this correlation disappears when we control for years since arrival, including the complete set of years since migration dummies used in our primary regressions (coefficients marked with red circles). Even after conditioning out years since migration, education and area of origin are still correlated with our instrument. These remaining correlations reflect differences across EU countries in their naturalization regimes and the composition of their migrant populations, and approach zero when we further include a complete set of interactions of host country dummies and year dummies (coefficients marked by green squares). This latter specification includes all the controls used in our main analysis. When we account for host country, interview year, and years since arrival fixed effects, all coefficients are nicely aligned around zero.[12] These results not only provide supporting evidence for the validity of our instrument but also suggest that concerns about the potential self-selection of migrants into different naturalization regimes may be limited. We will further discuss this issue in Section 5.3.

5 2SLS Estimates

5.1 Main Results

In Table 4, we present 2SLS estimates of equation (1) with employment, labor market participation, and unemployment as dependent variables in the first three columns. The last three columns provide reduced-form (RF) estimates for the same outcomes. In our central regression equation (1), the potentially endogenous $Naturalized$ variable enters both linearly and interacted with the refugee dummy. Thus, the variables $Naturalized$ and $Naturalized \times Refugee$ are instrumented with $Years\ of\ Eligibility$ and with the interaction $Years\ of\ Eligibility \times Refugee$. We report first-stage regressions in Appendix Table A.2. At the bottom of Table 4, we show the first-stage F-statistics, indicating that the probability of naturalization is strongly influenced by the number of years of potential eligibility for both refugees and non-refugees. Since our instrument varies at the host country and year

[12] Although very small in magnitude, some estimated coefficients (age 25-29, age 30-34, primary education, Other Europe) are still significant at conventional statistical levels. In section 5.3, we will empirically address potential threats to our identification strategy.

of arrival level, we cluster standard errors correspondingly, resulting in 345 clusters.

Table 4: Effect of Naturalization on Labor Market Outcomes (2SLS and RF estimates)

	(1)	(2)	(3)	(4)	(5)	(6)
	empl	lmp	unempl	empl	lmp	unempl
VARIABLES	2SLS	2SLS	2SLS	RF	RF	RF
Naturalized	0.043	0.048	0.014			
	[0.098]	[0.089]	[0.067]			
Refugee	-0.164***	-0.127***	0.084***	-0.132***	-0.104***	0.061***
	[0.021]	[0.019]	[0.016]	[0.014]	[0.014]	[0.011]
Naturalized x Refugee	0.183***	0.134***	-0.103***			
	[0.034]	[0.032]	[0.029]			
Years of eligibility				-0.001	0.000	0.001
				[0.002]	[0.002]	[0.002]
Years of eligibility x Refugee				0.005***	0.004***	-0.003***
				[0.001]	[0.001]	[0.001]
Observations	131,670	131,670	99,291	131,670	131,670	99,291
Year x Host Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Age Gender Education FE	Yes	Yes	Yes	Yes	Yes	Yes
Origin Area FE	Yes	Yes	Yes	Yes	Yes	Yes
YSM FE	Yes	Yes	Yes	Yes	Yes	Yes
F-stat: Naturalized	37.71	37.71	28.80			
F-stat: Naturalized x Refugee	106.5	106.5	103.4			
Avg Out.: Non-Nat. Migrants	0.641	0.741	0.134			

Note: Columns 1–3 report results from separate 2SLS regressions of dummies for employment (column 1), labor market participation (column 2), or unemployment (column 3) on a dummy for being naturalized, a refugee dummy and their interaction. Columns 4–6 report estimates for the corresponding Reduced Form (RF) regressions for the same three outcomes. All regressions include "Year x Host Country FE", the interaction of year and host country dummies; "Age Gender Education FE", a set of dummies for five-year age brackets, female and primary, secondary or tertiary education; "Origin area FE", dummies for macro-area of origin; "YSM FE", a set of dummies that identify each year since arrival in the host country until ten years of residence, and five-year intervals thereafter. The variables "Naturalized" and "Naturalized x Refugee" are instrumented with "Years of Eligibility" and the interaction "Years of Eligibility x Refugee". "Years of Eligibility" is defined as the difference between years since migration and the minimum number of years of residence required for naturalization if the difference is positive and zero otherwise. Standard errors clustered at YSM-host country level (345 clusters): *** p<0.01, ** p<0.05, * p<0.1

The 2SLS estimates in Table 4 reaffirm our key finding from the OLS estimates in Tables 2 and 3: returns to citizenship for refugees are positive and greater than those for other migrants. The 2SLS estimates regarding the impact of naturalization on the employment probability, labor market participation, and unemployment of non-refugee migrants are sim-

ilar in magnitude to those discussed in section 3.2. However, these estimates are notably less precise, making it impossible to conclusively reject the null hypothesis that naturalization has no causal effect on their labor market outcomes. Conversely, for refugees, naturalization is found to have a positive causal effect on all three outcomes, enabling them to bridge the gap with other migrants completely. The reduced form estimates reported in columns (4)–(6), reassuringly align with the 2SLS results. These estimates show that a higher number of years of (potential) eligibility for naturalization increases refugees' employment and participation and decreases their unemployment probability. Yet, this effect is not observed for other migrants. Since the former group exhibits considerably weaker labor market outcomes than the latter, these results suggest that obtaining citizenship offers greater advantages to those who encounter more challenges in their economic integration (as suggested also by the findings in Gathmann & Keller (2018) and Hainmueller et al. (2019)).

5.2 Heterogeneity and Robustness Checks

Heterogeneity. We explore the heterogeneity of our estimates across gender and education levels. Appendix Table A.3 shows that the labor market effects of naturalization are similar for men and women. Although the point estimates of β_1 in (1) are different between male and female immigrants – with the estimated returns to naturalization in terms of employment and participation (unemployment) being positive (negative) for women and centered around zero for men – the estimates are too imprecise to be statistically significant at conventional levels. On the contrary, the estimates of β_3, the additional return to naturalization for refugees, are positive and of similar magnitude for both genders for all three outcomes considered. More pronounced heterogeneity is observed for migrants with different levels of education, as shown in Appendix Table A.4. For non-refugee migrants, the estimated returns to citizenship do not reach statistical significance, regardless of their educational qualifications. In contrast, a distinct education gradient is evident among refugees. The returns to citizenship are relatively modest and imprecisely estimated for refugees with at most primary education. Conversely, they are substantial and precisely estimated for refugees with tertiary education and even more for those with upper secondary education. In the case of the latter two education groups, naturalization completely closes the initial refugee gap.

Robustness checks. The distribution of refugees and non-refugees varies across areas of origin, and the incentives to naturalize might also differ across migrants from different source

regions. To make sure that our results are not driven by one specific group of migrants, we have replicated our estimates, dropping, in turn, all migrants from each of the five areas of origin we are considering. The results, summarized in Appendix Figure A.5, show that neither the OLS nor the 2SLS estimates of the effect of naturalization for refugees' labor market outcomes depend on including migrants from a specific source area. Similarly, in Appendix Figure A.6 we test the robustness of our estimates to dropping any of the eight major host countries in our sample (which jointly accounts for 75% of the observations; see Appendix Table A.1). Furthermore, in Appendix Figures A.7 and A.8, we summarize the estimates for our main coefficient of interest obtained when excluding, respectively, one immigrant cohort, or one survey year at a time.[13] Both OLS and 2SLS estimates remain stable when excluding destination countries or immigrant cohorts, while they are more sensitive to the exclusion of survey year. In particular, excluding the year 2021 from the sample tends to make the effect of naturalization for refugees even more positive than when it is included. The exclusion of years 2008 or 2014 instead affects only marginally the estimates.

In Appendix Table A.5, we test the robustness of our main estimates by including an additional set of fixed effects obtained through interactions with those already present in our primary specification. Specifically, we focus on employment status and, for comparison, we present our baseline estimates in column 1 (identical to those in column 1 of Table 4). We first allow individual characteristics (age, gender, and education) to differentially affect the employment status of individuals across areas of origin (column 2), residence duration in Europe (column 3), and both dimensions simultaneously (column 4). We then proceed to interact area of origin dummies with host country and interview year dummies (column 5) to capture potential differences in the employment probability of immigrants from any given origin area arriving in different destination countries and in different years. Additionally, we condition on interactions between years since arrival dummies and areas of origin and interview year dummies (column 6) to control for differential gradients in the employment assimilation profiles of migrants with different geographical origins and who arrived at different points in time in Europe. Finally, in column 7, we condition on both sets of interactions used in the previous two columns. The estimated coefficients reported in Appendix Table A.5 remain remarkably stable across all these specifications.

[13]Note that our cohort definitions are partly overlapping since we cannot precisely define the same entry cohorts across the three survey years due to bunching in the year of entry variable (see footnote 5).

5.3 Potential Threats to Identification

5.3.1 Additional Naturalization Requirements

The duration of residence is a primary requirement for naturalization, and it is a predetermined factor that potential applicants cannot manipulate. However, many countries impose additional prerequisites, such as language fluency, knowledge of the country's history and customs, and economic self-sufficiency tests, for migrants to qualify for citizenship (see section 2.3 and Appendix Figure A.2). These additional conditions can influence the probability of naturalization and may lead to changes in behavior among migrants and refugees *before* the naturalization occurs. For instance, a language requirement can increase incentives for individuals to invest in host-country-specific human capital, which can positively affect labor market outcomes regardless of their citizenship status. Since the presence of these additional naturalization requirements may be correlated with the residence duration requirement (which determines how we calculate years of potential eligibility - our instrument), leaving them in the error term may introduce biases that our IV strategy cannot eliminate.

We address this potential concern by explicitly controlling in equation (1) for the presence of supplementary requirements (beyond minimum residency duration) at the time of arrival in the host country. We model the presence of such requirements controlling for a variable ("*# other requirements*") that counts the number of additional naturalization conditions. This variable can take values between 0 (indicating that a country has no additional conditions) and 5 (for countries with requirements related to language fluency, country knowledge, self-sufficiency, absence of criminal records, and renunciation of previous nationality). In our sample, the mean value of this variable is 2.24, with a standard deviation of 1.56.[14] Table 5 presents the OLS, 2SLS, and reduced form estimates of our augmented equation (1) for the three labor market outcomes: employment (columns 1-3), labor force participation (columns 4-6), or unemployment (columns 7-9). The estimated coefficients on the presence of additional requirements suggest that they significantly increase the employment probability of foreign-born workers.[15] Importantly, the sign, magnitude, and precision

[14]Notice that we control for the *presence* of such additional requirements. Still, we have no information on whether the migrants satisfy or not any of those requirements at any point in time.

[15]The magnitude of this effect is small: according to the estimates reported in column (2) of Table 5, the presence of one additional requirement at arrival is associated with a 1 p.p. (or 1.5% relative to a baseline 64% average employment probability) higher probability of being employed at the time of the interview.

of the estimates for our key parameters of interest are unaffected.

Table 5: Naturalization and Labor Market Outcomes - Other Requirements at Arrival (OLS, 2SLS and RF estimates)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	empl	empl	empl	lmp	lmp	lmp	unempl	unempl	unempl
VARIABLES	OLS	2SLS	RF	OLS	2SLS	RF	OLS	2SLS	RF
Naturalized	0.039***	0.036		0.029***	0.045		-0.019***	0.020	
	[0.010]	[0.093]		[0.009]	[0.088]		[0.006]	[0.066]	
Refugee	-0.111***	-0.158***	-0.126***	-0.091***	-0.124***	-0.101***	0.051***	0.080***	0.057***
	[0.013]	[0.021]	[0.014]	[0.012]	[0.020]	[0.014]	[0.010]	[0.016]	[0.011]
Naturalized x Refugee	0.076***	0.177***		0.061***	0.131***		-0.040***	-0.099***	
	[0.016]	[0.034]		[0.014]	[0.032]		[0.013]	[0.030]	
Years of eligibility			-0.001			-0.000			0.001
			[0.002]			[0.002]			[0.001]
Years of eligibility x Refugee			0.005***			0.004***			-0.003***
			[0.001]			[0.001]			[0.001]
# other requirements	0.011**	0.009*	0.010**	0.005	0.004	0.004	-0.006*	-0.005	-0.006
	[0.005]	[0.005]	[0.005]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]
Observations	131,670	131,670	131,670	131,670	131,670	131,670	99,291	99,291	99,291
Year x Host Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age Gender Education FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Origin Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YSM FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-stat: naturalized		37.34			37.34			29.18	
F-stat: naturalized x refugee		109.2			109.2			105.5	

Note: The table reports results from OLS (columns 1 and 4) and 2SLS (columns 2 and 5) regressions of dummies for employment (columns 1–2), labor force participation (columns 4–5), or unemployment (columns 7–8) on a dummy for being naturalized, a refugee dummy, their interaction and a variable counting the number of additional requirements for naturalization (beyond minimum residency) that were in place at the time of arrival. All regressions include "Year x Host country FE", the interaction of year and host country dummies; "Age Gender Education", a set of dummies for five-year age brackets, female and primary, secondary or tertiary education; "Origin area FE", dummies for each macro-area of origin; "YSM FE", a set of dummies that identify each year since arrival in the host country until ten years of residence, and five-year intervals thereafter. The variables "Naturalized" and "Naturalized x Refugee" are instrumented with "Years of Eligibility" and the interaction "Years of Eligibility x Refugee". "Years of Eligibility" is defined as the difference between years since migration and the minimum number of years of residence required for naturalization if the difference is positive and zero otherwise. Columns (3), (6), and (9) report estimates for the corresponding Reduced Form (RF) regressions. Standards errors in 2SLS and RF regressions are clustered at YSM - host country level (345 clusters): *** p<0.01, ** p<0.05, * p<0.1

5.3.2 Self-Selection into Naturalization Regimes

Migrants who are particularly committed to integrating into host societies might deliberately choose to migrate to countries with more lenient naturalization rules. At the same time, they may also exhibit better labor market outcomes compared to those with lower motivation for

socio-economic integration. To the best of our knowledge, no empirical evidence indicates that migrants engage in this type of self-selection, and it appears quite unlikely, particularly for refugee migrants.[16] However, if such a selection were to exist, it would invalidate the exclusion restriction of our eligibility instrument, thereby undermining our identification strategy. Reassuringly, the balance tests presented in Figure 4 point to a lack of self-selection into naturalization regimes based on observable characteristics. In this section, we further address this concern to deal with potential selection on unobservables.

Specifically, we replicate our main estimates restricting the sample only to the migrants who experienced at least one restrictive change on the minimum residence requirement or the additional requirements for naturalization *after* they arrived in the host country. This approach minimizes concerns about migrants consciously choosing a specific destination country because of its generous citizenship acquisition regime and allows us to rule out potential violations of the exclusion restriction. It is important to note that during the period under study, EU countries experienced multiple changes in citizenship policies. These reforms affected both the minimum residency requisite and the additional requirements, making the naturalization conditions sometimes more restrictive and sometimes more lenient. As Table A.6 shows, approximately 111.4 thousand individuals in our sample were not exposed to any restrictive change in naturalization rules (of which, 105.9 thousands were exposed to no change at all). However, the other 20.2 thousand respondents (about 15% of our sample) were exposed to an increase in the duration requirement, an increase in the number of additional requirements, or both. We present our 2SLS and RF estimates for employment and labor market participation in Appendix Table 6. Despite the considerably smaller sample size and the consequently lower strength of the first stage, which decreases the precision of the estimates, all of the estimated coefficients reported in Table 6 are reassuringly in line with those obtained from our main estimation strategy (see Tables 4 and 5). Note that, in this small subsample, years of eligibility are a particularly poor predictor of citizenship status for non-refugee migrants, as indicated by the low value of the first-state F-statistics. The

[16]Di Iasio & Wahba (2023) show that host country asylum policies do not matter much in refugees' choices of destination within the EU. Rather, the strongest pull factor for asylum seekers to a destination is social networks, both in terms of previous asylum applicants and stock of previous migrants. The results of Bertoli et al. (2022) indicate that differences in application processing times, recognition rate, and repatriation risk across EU countries have shaped the distribution of asylum seekers across EU countries. However, no studies indicate that long-term policies, such as naturalization requirements, directly impact asylum seekers' location decisions. See also Aksoy & Poutvaara (2021) for an analysis of refugees' self-selection in European countries.

weakness of the instrument in this case might raise the concern that the lack of a statistically significant labor market return to citizenship for non-refugees is driven by the failure of the rank condition. However, the reduced form estimates clearly show that the number of years of eligibility has no effect on migrants' labor market outcomes and, thus, that the lack of a significant effect in the 2SLS estimates is not a statistical artifact.

Table 6: Naturalization and Labor Market Outcomes: only changes IV (2SLS and RF)

	(1)	(2)	(3)	(4)
	empl	lmp	empl	lmp
VARIABLES	2SLS	2SLS	RF	RF
Naturalized	-0.095	-0.545		
	[0.697]	[0.835]		
Refugee	-0.229***	-0.224**	-0.149***	-0.134***
	[0.067]	[0.086]	[0.038]	[0.036]
Naturalized x Refugee	0.231**	0.259*		
	[0.113]	[0.152]		
Years of eligibility			-0.006	-0.001
			[0.007]	[0.007]
Years of eligibility x Refugee			0.005**	0.005**
			[0.002]	[0.002]
# other requirements	0.004	0.013	0.024	0.025
	[0.018]	[0.021]	[0.014]	[0.016]
Observations	20,241	20,241	20,241	20,241
Year x Host Country FE	Yes	Yes	Yes	Yes
Age Gender Education FE	Yes	Yes	Yes	Yes
Origin Area FE	Yes	Yes	Yes	Yes
YSM FE	Yes	Yes	Yes	Yes
F-stat: naturalized	1.473	1.473		
F-stat: naturalized x ref.	30.20	30.20		

Note: Columns 1-2 (3-4) report results from separate 2SLS (reduced form) regressions of a dummy for employment (column 1) or a dummy for labor market participation (column 2) on a dummy for being naturalized, a refugee dummy, their interaction, and a variable counting the number of additional requirements for naturalization (beyond minimum residency) that were in place at the time of arrival. All regressions include "Year x Host country FE", the interaction of year and host country dummies; "Age Gender Education", a set of dummies for five-year age brackets, female and primary, secondary or tertiary education; "Origin area FE", dummies for each macro-area of origin; "YSM FE", a set of dummies that identify each year since arrival in the host country until ten years of residence, and five-year intervals thereafter. The variables "Naturalized" and "Naturalized x Refugee" are instrumented with "Years of Eligibility" and the interaction "Years of Eligibility x Refugee". "Years of Eligibility" is defined as the difference between years since migration and the minimum number of years of residence required for naturalization if the difference is positive and zero otherwise. Standard errors clustered at YSM-host country level (78 clusters): *** p<0.01, ** p<0.05, * p<0.1

6 Further Results

6.1 Job Quality

The results discussed so far demonstrate that naturalization is associated with significantly larger gains in employment and labor market participation for refugees compared to other migrants. However, among migrant workers who are already employed, naturalization may potentially be associated with improvements in other labor market dimensions, allowing them to access better occupations or to find a better match for their skills. We explore the impact of naturalization on ten different dimensions of job quality in Table 7, where each column reports the results of a 2SLS regression with a different dependent variable and the sample consists – by construction – of employed immigrants only. Corresponding OLS estimates are reported in Appendix Table A.7. The Table reveals that refugees generally experience lower job quality than other migrants with similar characteristics. Among the ten job features we can observe, the only ones with no statistically significant differences between refugees and other migrants are the probability of being self-employed and the likelihood of feeling over-qualified for the job. Additionally, the Table shows that naturalization does not yield a statistically significant causal impact on the occupational quality of non-refugees, regardless of the specific outcome examined. On the other hand, it confirms that naturalization significantly improves refugees' labor market prospects, including their occupational quality. In seven of the ten job quality dimensions analyzed, naturalization helps refugees narrow the gap with other migrants. In particular, for refugees, naturalization leads to a higher likelihood of having a highly skilled job (column 1),[17] performing a supervisory role (column 3), working for a large firm (i.e., 50 employees or more, column 4), having a full-time job (column 5), and being employed with a permanent contract (column 8). It also leads to an increase in the number of hours worked per week (column 6) and a reduction in the share of refugees willing to work more hours than they currently do (column 7).

[17]We define as "high skilled" occupations classified in ISCO major groups 1, 2 or 3, i.e., "Managers", "Professionals" and "Technicians and associate professionals". We define as "low skilled" occupations in ISCO major group 9, i.e., "Elementary occupations".

Table 7: Naturalization and Occupational Quality - 2SLS estimates

VARIABLES	(1) high_skill	(2) low_skill	(3) superv_role	(4) large_firm	(5) full_time	(6) hours_work	(7) more_hours	(8) perm_job	(9) selfempl	(10) overqual
Naturalized	0.084	-0.048	0.094	-0.037	-0.093	-0.350	-0.038	-0.077	-0.053	0.051
	[0.097]	[0.099]	[0.069]	[0.096]	[0.081]	[2.126]	[0.093]	[0.091]	[0.077]	[0.187]
Refugee	-0.131***	0.068***	-0.078***	-0.099***	-0.092***	-1.959***	0.074***	-0.075***	0.009	0.117
	[0.018]	[0.022]	[0.014]	[0.025]	[0.023]	[0.574]	[0.020]	[0.025]	[0.015]	[0.086]
Naturalized x Refugee	0.093***	-0.037	0.071***	0.100***	0.104***	1.808**	-0.070**	0.107***	-0.004	-0.071
	[0.036]	[0.040]	[0.024]	[0.037]	[0.034]	[0.918]	[0.030]	[0.036]	[0.025]	[0.128]
Observations	86,163	86,163	76,651	74,560	86,511	85,181	85,881	76,767	86,605	14,514
Year x Host Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age Gender Education FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Origin Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YSM FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avg Outcome: Non-Nat. Migrants	0.202	0.389	0.126	0.319	0.769	36.73	0.144	0.794	0.101	0.329
F-stat: naturalized	27.96	27.96	29.29	31.30	28.14	26.28	28.28	29.31	28.08	16.97
F-stat: naturalized x refugee	95.09	95.09	99.32	94.48	95.31	92.96	95.19	100.1	95.20	47.88

Note: Each column reports results from separate 2SLS regressions of different variables capturing job quality on a dummy for being naturalized, a refugee dummy, and their interaction. The dependent variables are: a dummy for having a high- (ISCO codes 1, 2, 3) or low- (ISCO code 9) skilled job (columns 1 and 2 respectively); dummies for: having a supervisory role (column 3), working in a firm with 50 or more employees (column 4), working full time (column 5); willing to work more hours than currently worked (column 7), having a permanent job (column 8), being self-employed (column 9), feeling over-qualified (column 10); the number of weekly working hours (column 6). All regressions include "Year x Host country FE", the interaction of year and host country dummies; "Age Gender Education", a set of dummies for five-year age brackets, female and primary, secondary or tertiary education; "Origin area FE", dummies for each macro-area of origin; "YSM FE", a set of dummies that identify each year since arrival in the host country until ten years of residence, and five-year intervals thereafter. The sample includes refugees and other migrants from outside the EU, North America, and Oceania who are in employment. The variables "Naturalized" and "Naturalized x Refugee" are instrumented with "Years of Eligibility" and the interaction "Years of Eligibility x Refugee". "Years of Eligibility" is defined as the difference between years since migration and the minimum number of years of residence required for naturalization if the difference is positive and zero otherwise. Standard errors clustered at YSM-host country level (345 clusters): *** p<0.01, ** p<0.05, * p<0.1

6.2 Differential Responsiveness to Naturalization Rules

Citizenship laws may produce different effects on different migrant groups. In our first stage regressions (Appendix Table A.2), we have allowed the effect of years of eligibility to be different between refugees and other migrants by using $Years\ of\ Eligibility$ and $Years\ of\ Eligibility \times Refugee$ as instruments. However, we have not explicitly discussed the estimated coefficients from the first-stage regressions. Nor have we explored potential heterogeneity in the effect of additional requirements between refugees and non-refugees. In this section, we investigate the differential responsiveness of refugees and other migrants to the different types of naturalization requirements. To this end, we regress the dummy for naturalization on a refugee dummy, $Years\ of\ Eligibility$, and the variable counting the number of additional naturalization conditions beyond minimum residency ("$\#$ *other requirements*"), as well as on the interaction of these two latter variables with the refugee dummy. The usual set of control variables and fixed effects are also included. We have re-centered both $Years\ of\ Eligibility$ and the number of additional naturalization conditions so that they have mean zero to facilitate the interpretation of the refugee dummy.

Results from this analysis are displayed in Table 8. The estimates reported in column (1) show no statistically significant difference in the probability of naturalization between refugees and other migrants once we control for differences in individual characteristics and years of eligibility. They also show that, on average across refugees and other migrants, each additional year of eligibility increases the probability of naturalization by 2.5 percentage points. The specification in column (2) – which is exactly our first stage regression in section 5 – allows these "returns to eligibility" to be heterogeneous between refugees and other migrants: it shows that while each additional year of eligibility increases the naturalization probability by 2.4 p.p. for all migrants, the effect for refugees is 0.3 p.p. (12.5%) larger. In column (3), we further control for the number of additional naturalization requirements, and we allow the effect of these additional requirements to vary between refugees and non-refugees in column (4). Notably, we find that the restrictiveness of the naturalization policy (as measured by these additional constraints) disproportionately affects refugees' likelihood of citizenship acquisition. Indeed, according to the estimates in column (4), additional requirements for naturalization do not impact non-refugees' chances of acquiring the host country's nationality. Still, they do have a negative and precisely measured effect on refugees, whose probability of naturalization is reduced by about 3 p.p. for each additional requirement. Overall, these estimates suggest that refugees may suffer more from the re-

strictiveness of the naturalization policy relative to migrants while, at the same time, being more likely to attempt to naturalize once the residency eligibility criteria are met.

Table 8: Refugee-Migrant Gaps in Citizenship Acquisition - Differential Return for Refugees

	(1)	(2)	(3)	(4)
	Naturalized	Naturalized	Naturalized	Naturalized
VARIABLES	LPM	LPM	LPM	LPM
Refugee	-0.015	-0.017	-0.020	-0.025*
	[0.014]	[0.014]	[0.014]	[0.013]
Years of eligibility	0.025***	0.024***	0.024***	0.024***
	[0.003]	[0.003]	[0.003]	[0.003]
Years of eligibility x Refugee		0.003***	0.003***	0.002*
		[0.001]	[0.001]	[0.001]
# other requirements			-0.007	-0.005
			[0.006]	[0.006]
# other requirements x Refugee				-0.031***
				[0.008]
Observations	131,670	131,670	131,670	131,670
Year x Host Country FE	Yes	Yes	Yes	Yes
Age Gender Education FE	Yes	Yes	Yes	Yes
Origin Area FE	Yes	Yes	Yes	Yes
YSM FE	Yes	Yes	Yes	Yes
Avg Outcome - Migrants	0.383			

Note: Each column reports results from separate regressions of a dummy for being a citizen of the country of residence on a refugee dummy, the number of years of eligibility. Column (2) additionally includes the interaction of these two variables. Column (3) also includes a variable measuring the number of additional requirements for naturalization beyond naturalization in place when the migrant entered the host country, and column (4) adds the interaction of this variable with the refugee dummy. All regressions include "Year x Host country FE", the interaction of year and host country dummies; "Age Gender Education", a set of dummies for five-year age brackets, female and primary, secondary or tertiary education; "Origin area FE", dummies for each macro-area of origin; "YSM FE", a set of dummies that identify each year since arrival in the host country until ten years of residence, and five-year intervals thereafter. Years of eligibility and the number of additional requirements have been re-centered to have mean zero to facilitate the interpretation of the coefficient on the refugee dummy. Standard errors clustered at YSM-host country level (345 clusters): *** p<0.01, ** p<0.05, * p<0.1

7 Estimating Marginal Treatment Effects

One key result from our analysis is that the returns to citizenship are significantly higher for refugees than other migrants. Since the former group exhibits considerably weaker labor

market outcomes than the latter, we can conclude that obtaining citizenship offers greater advantages to those who encounter more challenges in their economic integration. This finding and its interpretation echo similar heterogeneity observed in other settings. In Germany, Gathmann & Keller (2018) estimate a positive impact of faster access to naturalization on women's employment and no effect for men, with the effect concentrated on women with low previous labor market attachment; while in Switzerland Hainmueller et al. (2017, 2019) find a positive impact on social and economic integration only for migrants groups who are relatively more marginalized. Overall, this body of evidence highlights substantial heterogeneity in the economic benefits of naturalization, raising a critical policy question: Do the migrants who stand to gain the most from obtaining citizenship tend to be more likely to naturalize? Answering this question is essential for shaping citizenship policies and evaluating whether the government should consider relaxing rather than tightening existing eligibility criteria. In this last section of the paper, we adopt a Marginal Treatment Effects approach (Carneiro et al. 2011, Cornelissen et al. 2016) to carefully explore heterogeneity in returns to citizenship with respect to both observed and unobserved characteristics.[18]

Estimation strategy. We adopt a standard framework in the applied MTE literature to model individual selection into the naturalization treatment and the potential labor market outcomes of treated (i.e., naturalized) and untreated (i.e., non-naturalized) individuals. In particular, the decision to take the treatment is determined by a set of individual observable characteristics and by unobserved factors that, in the MTE literature, are commonly referred to as the individual "unobserved resistance" to treatment.[19] While our theoretical framework is described in detail in Appendix Section A.4, here we focus the discussion on our estimation strategy and findings. We follow Brinch et al. (2017) and Cornelissen et al. (2018) and assume that the marginal treatment effect is additively separable into an observed ($x(\beta_1 - \beta_0)$) and an unobserved component ($E(U_1 - U_0|W_D = w_D)$):

$$MTE(x, w_D) = E(Y_1 - Y_0|X = x, W_D = w_D) = x(\beta_1 - \beta_0) + E(U_1 - U_0|W_D = w_D) \quad (2)$$

[18]Gathmann et al. (2021) use a similar MTE approach to estimate heterogeneity in the effect of citizenship on immigrant children educational outcomes.

[19]In our setting, this "resistance" encompasses any individual determinant that reduces the propensity to apply for citizenship and successfully acquire it. These factors can include both unobservable traits (such as attachment to the home country, motivation to integrate in the host country, or risk aversion) and potentially observable variables that are not part of our dataset (like the ability to cover naturalization expenses, individual income, language proficiency, and a clean criminal record).

where X are the observable characteristics of the individual and W_D is the *unobserved resistance* to treatment. Note that under the additive separability assumption, the treatment effect heterogeneity resulting from the observed characteristics X affects the intercept of the MTE curve as a function of W_D, but its slope in W_D does not depend on X. In our specific case, this assumption implies that the estimated MTE profiles for refugees and other migrants will differ solely in their intercept. Following Cornelissen et al. (2018), we write the outcome as a function of the observed regressors X and the propensity score function $P(Z) = E[C = 1|Z]$, where C is the citizenship treatment and Z are individual characteristics determining the treatment decision (Z includes the same controls X as the outcome equation and one or more instruments $\tilde{Z}$ excluded from the outcome equation). We then estimate the MTE according to the following equation:

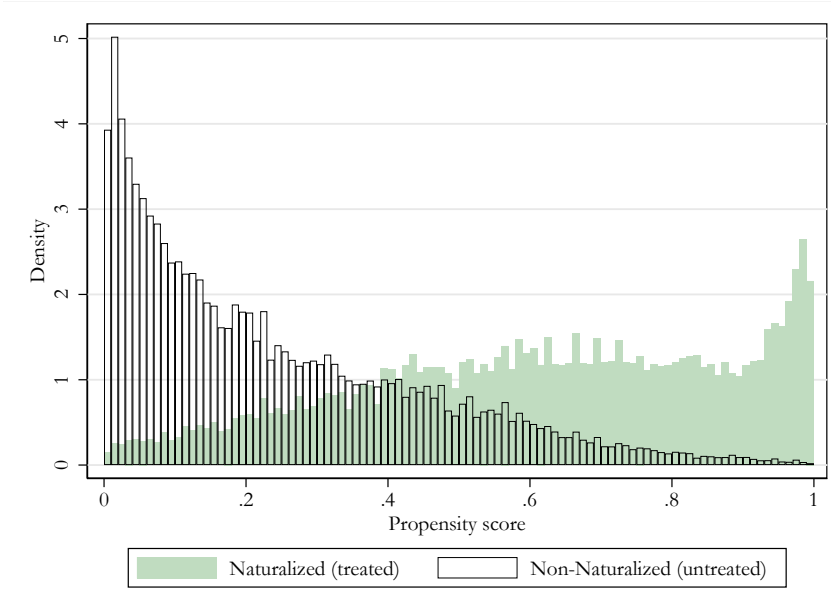
$$E[Y|X = x, P(Z) = p] = X\beta_0 + X(\beta_1 - \beta_0)p + K(p) \tag{3}$$

where p is the propensity score and $K(p)$ is a nonlinear function of the propensity score.[20] In our baseline results, we estimate the model using Local IV, a parametric polynomial MTE model of 2nd order and a probit first stage for selection into treatment (as in Cornelissen et al. (2018)). The excluded instruments for naturalized status in the probit regression are the $Years\ of\ Eligibility$ variable (see section 4) and its interaction with a refugee dummy. Our baseline (unrestricted) model includes interaction terms of all control variables with the propensity score, flexibly allowing for heterogeneous effects along all observable dimensions. We then test the robustness of our findings by using alternative first-stage estimators, set of instruments, and polynomials, and by using a more restricted and parsimonious model in which we interact only the refugee and female dummies with the propensity score. As in the previous analysis, we focus on three labor market outcomes (employment, participation, and unemployment), and we cluster standard errors at the entry cohort-host country level.

[20] Note that the derivative of the outcome equation (3) with respect to p delivers the MTE for $X = x$ and $W_D = p$:

$$\frac{\partial E[Y|X = x, P(Z) = p]}{\partial p} = X(\beta_1 - \beta_0) + \frac{\partial K(p)}{\partial p} = MTE(X = x, W_D = p) \tag{4}$$

Figure 5: Common Support (Probit - 2 IVs)



Note: The Figure displays the distribution of propensity score by treatment status. The propensity score is predicted from the baseline first stage probit regression (see coefficients in column 1 of Table A.8) in which the naturalized dummy is instrumented with the *Years of Eligibility* variable and its interaction with a refugee dummy.

Selection Equation and Common Support. Appendix Table A.8 reports results from estimating our selection (or first stage) equation: the outcome variable is a dummy for being naturalized, and we regress it on all individual controls and fixed effects (as in our main analysis) and on the instrument(s). Our baseline estimates are reported in column (1): the equation is estimated with a Probit estimator using two excluded instruments (*Years of Eligibility* and *Years of Eligibility* $\times$ *Refugee*). As in the first stage regression of our main analysis (see Appendix Table A.2), the estimated coefficients imply that the naturalization probability increases with years of eligibility and that the gradient is significantly steeper for refugees. Figure 5 plots the propensity scores for naturalized (treated) and non-naturalized (untreated) individuals in our sample that we obtain from this Probit regression. As expected, the distribution of propensity scores among treated individuals is notably skewed towards the right in comparison to untreated individuals. Nevertheless, the first stage ensures consistent support for the propensity score across its entire distribution.[21]

[21] Appendix Table A.8 reports estimates of the selection equation obtained from alternative estimators: a Probit using only the *Years of Eligibility* variable as instrument (without the interaction term; column 2), a Logit (column 3) and a LPM (column 4). Note that the LPM estimates in Table A.8 are identical to the

Table 9: MTE: Outcome Equation

	(1)	(2)	(3)	(4)	(5)	(6)
	Employment		LMP		Unemployment	
	2 IVs	1 IV	2 IVs	1 IV	2 IVs	1 IV
	Panel A - Refugees: β_0 and $(\beta_1 - \beta_0)$					
Refugee	-0.140***	-0.147***	-0.118***	-0.123***	0.063***	0.066***
	[0.018]	[0.019]	[0.019]	[0.019]	[0.012]	[0.012]
Refugee x Propensity Score	0.138***	0.158***	0.125***	0.141***	-0.058***	-0.064***
	[0.029]	[0.029]	[0.029]	[0.030]	[0.019]	[0.020]
Observations	131,670	131,670	131,670	131,670	99,291	99,291
	Panel B - Treatment Effects					
ATE	0.161*	0.171*	0.080	0.113	-0.107	-0.092
	[0.097]	[0.101]	[0.077]	[0.079]	[0.087]	[0.084]
ATT	-0.011	0.000	-0.056	-0.033	-0.036	-0.026
	[0.113]	[0.115]	[0.095]	[0.097]	[0.092]	[0.091]
ATUT	0.278**	0.287**	0.173*	0.213**	-0.159	-0.141
	[0.118]	[0.121]	[0.090]	[0.090]	[0.107]	[0.102]

Note: The table reports estimates of the outcome equation (3) for the following binary outcomes: employment (columns 1-2), labor market participation (columns 3-4), and unemployment (columns 5-6). The model is estimated using Local IV and a parametric polynomial MTE model of 2nd order. All control variables and fixed effects are interacted with the propensity score (unrestricted model). The selection (first stage) equation is estimated with a Probit estimator in which the naturalization treatment status is instrumented with the *Years of Eligibility* variable and its interaction with a refugee dummy (2 IVs; odd columns) and, alternatively, with the *Years of Eligibility* variable alone (1 IV; even columns). All regressions include: "Year x Host Country FE", the interaction of year and host country dummies; "Age Gender Education FE", a set of dummies for five-year age brackets, female and primary, secondary or tertiary education; "Origin area FE", dummies for each macro-area of origin; "YSM FE", a set of dummies that identify each year since arrival in the host country until ten years of residence, and five-year intervals thereafter. Panel A reports the estimated coefficient on the refugee dummy (i.e., the expected outcome without treatment β_0) and its interaction with the propensity score (i.e., the treatment effect $\beta_1 - \beta_0$). Panel B reports estimated treatment effects: Average Treatment Effect (ATE), Average Treatment Effect on the Treated (ATT), and Average Treatment Effect on the Untreated (ATUT). Standards errors clustered at entry cohort-host country level (345 clusters): *** p<0.01, ** p<0.05, * p<0.1

Marginal Treatment Effects. Table 9 displays estimates of the outcome equation (3) for the three labor market outcomes considered: employment (columns 1-2), labor market participation (columns 3-4) and unemployment (columns 5-6). Estimated coefficients in odd

first stage regression in our main analysis (reported in column (1) of Appendix Table A.2). In the Appendix section (A.4), we report common support graphs (Appendix Figure A.10) and MTE profiles (Appendix Figure A.11) obtained from these alternative first stage regressions.

columns are obtained from our baseline model (i.e., parametric 2nd order polynomial; all control variables and fixed effects interacted with the propensity score; probit first stage with two instruments), while those in even columns are obtained using a single instrument in the probit regression. Panel A of Table 9 reports the estimated coefficients on the refugee dummy and on its interaction with the propensity score. These two coefficients identify the expected outcome without treatment and the treatment effect for refugees – i.e., β_0 and $(\beta_1 - \beta_0)$ in equation (3), respectively – and confirm that they suffer a disadvantage in all three labor market outcomes relative to other migrants and, at the same time, experience a significant and substantial gain from naturalization, which basically allows them to fully catch up with other migrants. These estimates thus confirm that naturalization produces heterogeneous returns for different migrant groups, as discussed in the previous sections.

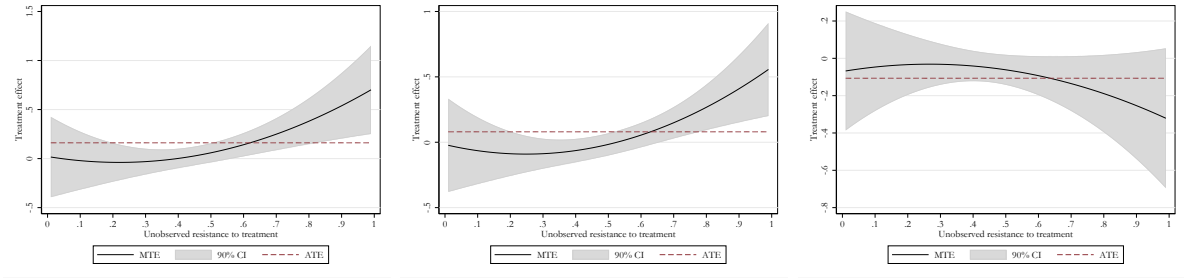
In addition to this heterogeneity with respect to observable characteristics, the estimated MTE profiles depicted in Figure 6 (obtained from our baseline model) and in Figure 7 (estimated using a single instrument) consistently indicate the presence of considerable heterogeneity with respect to unobserved characteristics. Specifically, the markedly positive slope of the profiles for employment and participation implies that the greatest benefits from naturalization would accrue to those individuals who exhibit the highest "unobserved resistance" to naturalization. A similar conclusion can be drawn from the negative slope of MTE on unemployment. Note that the positive and statistically significant treatment effect $(\beta_1 - \beta_0)$ on employment and labor market participation that we estimate for refugees (see Table 9, Panel A) implies an upward shift in the Marginal Treatment Effect (MTE) profiles for refugees in comparison to other migrants. This indicates that refugees stand to gain more from naturalization at any given level of *unobserved resistance*.[22]

The upward-sloping MTE profiles for employment and participation (and the downward-sloping one for unemployment) directly determine the estimates of the treatment effects reported in Panel B of Table 9. The Average Treatment Effect (ATE) estimates suggest that naturalization may yield positive labor market returns for the average migrant, although these estimates are only marginally significant for employment and non-significant for the other two outcomes. The Average Treatment Effect on the Treated (ATT) is estimated to be nearly zero, indicating that those who naturalize do not exhibit any clear improvement in their labor market status on average. Conversely, substantial gains seem potentially attain-

[22]Similarly, the negative coefficient for unemployment status results in a downward shift in the MTE profile for refugees (i.e., a larger unemployment-reducing effect of naturalization for refugee migrants).

able by those who do not naturalize, as implied by the positive and statistically significant estimates of the Average Treatment Effect on the Untreated (ATUT) for employment and labor market participation.

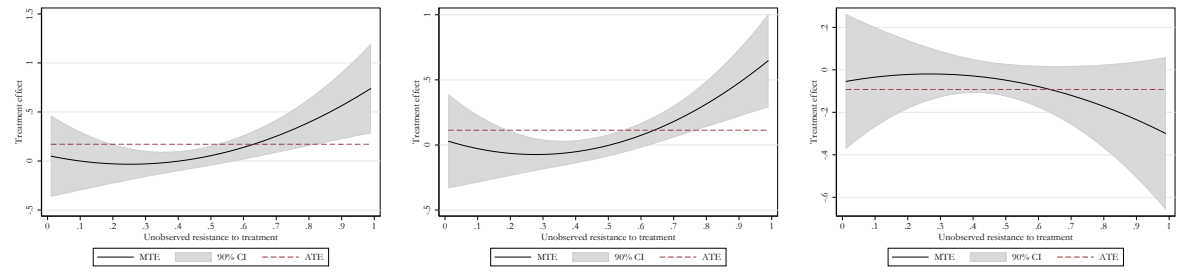
Figure 6: Marginal Treatment Effects (Probit - 2 IVs)



(a) Employment (b) LMP (c) Unemployment

Note: The Figure plots MTE curves at average values of the covariates for employment (panel 6a), labor market participation (panel 6b) and unemployment (panel 6c). The estimated MTE are obtained from our baseline model: (i) probit first stage; (ii) instruments: *Years of Eligibility* variable and its interaction with a refugee dummy; (iii) unrestricted model: all controls interacted with the propensity score. The 90 percent confidence interval is based on standard errors clustered at the YSM-host country level.

Figure 7: Marginal Treatment Effects (Probit - 1 IV)



(a) Employment (b) LMP (c) Unemployment

Note: The Figure plots MTE curves at average values of the covariates for employment (panel 7a), labor market participation (panel 7b) and unemployment (panel 7c). The estimated MTE are obtained from our baseline model: (i) probit first stage; (ii) instruments: *Years of Eligibility* variable; (iii) unrestricted model: all controls interacted with the propensity score. The 90 percent confidence interval is based on standard errors clustered at the YSM-host country level.

In Appendix Section A.4.3, we report several robustness checks for our MTE and depart from our baseline model in various ways. In particular, we test the sensitivity of our estimates to specification changes in the first stage regression (Appendix Figure A.11) in

the order of the polynomial in the second stage (Appendix Figure A.12) and in the set of controls interacted with the propensity score (Appendix Figure A.13).

Interpretation and Discussion. Our MTE estimates suggest that returns to naturalization are higher for those individuals who are less likely to acquire citizenship. This reverse selection on gains in terms of unobserved characteristics may appear challenging to reconcile with rational preferences. We would expect individuals with the greatest potential benefits to self-select into treatment, resulting in MTE profiles that decline as unobserved resistance increases, as found in studies such as Carneiro et al. (2011) for returns to college education in the U.S. Increasing MTE profiles however, have been estimated before in the applied MTE literature, for instance, for returns to childcare on educational outcomes (Cornelissen et al. 2018) and returns to naturalization for children's educational outcomes (Gathmann et al. 2021). These examples suggest that there may be settings where those who would benefit the most from treatment appear more hesitant to pursue it. The term "unobserved resistance" commonly used in MTE literature, suggests that the reluctance to take up the treatment is driven by individual preferences (i.e., demand). However, this unobserved dimension is a residual category, which includes every factor affecting treatment choice that is not included in the set of controls. In settings where treatment is rationed, selection occurs on both the demand and supply sides (Andresen (2019)). Access to citizenship is indeed heavily restricted, with significant application fees that can financially strain the most vulnerable households, and stringent eligibility requirements that make it more challenging for poorly integrated individuals to naturalize. In particular, naturalization requirements typically require applicants to be successfully integrated before treatment (i.e., to have a high Y_{0i}). Yet those who struggle the most to integrate and, consequently, to naturalize are likely the ones who would gain the most from naturalization. Note that we do not observe whether migrants meet these additional requirements (such as language proficiency, income, cultural integration, and a clean criminal record); hence, these factors all fall under the unobserved resistance term. Our findings on reverse selection on gains from citizenship on labor market outcomes reinforce similar findings by Gathmann et al. (2021) on educational outcomes of children. This alignment strongly suggests that relaxing eligibility rules for citizenship and facilitating the uptake rate of eligible migrants would likely yield favorable effects for both migrants and host societies.

8 Conclusions and Policy Implications

The conflict in Ukraine and the ongoing surge in asylum seekers from African countries and the Middle east have been poignant reminders for European institutions that the arrival of displaced people is not an isolated event. This underscores the urgent need to enhance national asylum policies and promote greater coordination and cooperation at the EU level. While short-term responses to refugee inflows remain a domain where EU policymaking appears to be trailing, it is crucial to focus on medium and long-term interventions. In 2014-2016, during the so-called European "refugee crisis", over a million refugees sought asylum in EU member states. Their prospects for long-term settlement on the continent remain uncertain. Notably, an increasing number of these refugees are now becoming eligible for naturalization. In Germany, which received the highest number of refugees during those years, nearly one-third of migrants who acquired German citizenship in 2022 originally hailed from Syria.[23]

Countries typically limit the provision of citizenship to outsiders and often regard naturalization as a "crown", a symbol of achievement for those who have attained a sufficient level of integration (Hainmueller et al. 2017). Citizenship is thus rationed, and such rationing may strengthen migrants' incentives to invest in host country specific human capital and their integration efforts. Indeed, becoming a member of a new political community through naturalization hinges on fulfilling various requirements, such as a minimum residency period in the host country, fluency in the national language, a clean criminal record, and sometimes the renunciation of previous citizenship. In return, naturalization in host countries grants migrants access to significant legal rights and entitlements, such as unrestricted residency, the freedom to enter and leave the state's territory, and the ability to participate in both active and passive suffrage. Even though the direct economic implications of acquiring citizenship are relatively limited, an ongoing argument suggests that it can serve as a "catalyst" for the socioeconomic integration of immigrants within host countries (Hainmueller et al. 2017). If the "catalyst" paradigm holds, it would logically follow for countries to offer naturalization to their foreign residents as early as possible, facilitating their integration and maximizing economic benefits for the host country rather than delaying until the integration process has concluded.

Our empirical analysis provides novel and important insight for designing naturaliza-

[23]Source: Federal Statistical Office of Germany.

tion rules. We demonstrate that migrants who differ in observable characteristics, such as their reason for arriving in Europe, may experience significantly different labor market returns to naturalization. Specifically, refugee migrants, who tend to lag in their integration compared to other migrants with similar characteristics, appear to benefit substantially from naturalization. Conversely, the average non-forced migrant does not experience statistically significant returns from naturalization. Such heterogeneity suggests that naturalization can substantially improve labor market outcomes for those individuals who otherwise face greater employment challenges. These conclusions are further reinforced by the results of our MTE analysis that go beyond the difference in returns for refugees and other migrants, pointing to positive returns for individuals who display higher resistance to the "naturalization treatment", while the impact is not significantly different from zero for those who have lower "resistance" and hence naturalize, regardless of their migratory status. Returns from naturalization, indeed, are estimated to be zero for "treated" individuals (ATT), while they would be positive and statistically significant for "untreated" ones (ATUT). These estimates strongly suggest that current citizenship regimes in European countries prevent access to naturalization precisely for those who could gain from it in terms of improved labor market integration. This finding thus implies that making eligibility rules more lenient for all types of migrants – and not just refugees – may potentially lead to more economically active and integrated migrant workers while yielding sizeable economic benefits for hosting societies.

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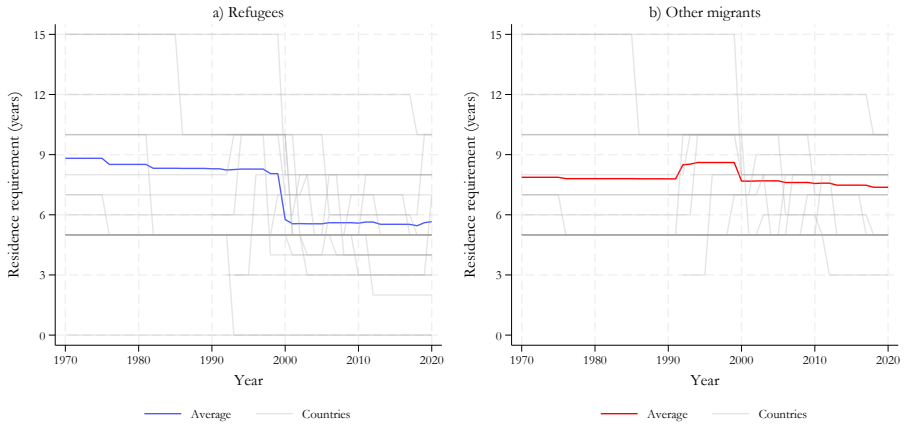
A Appendix

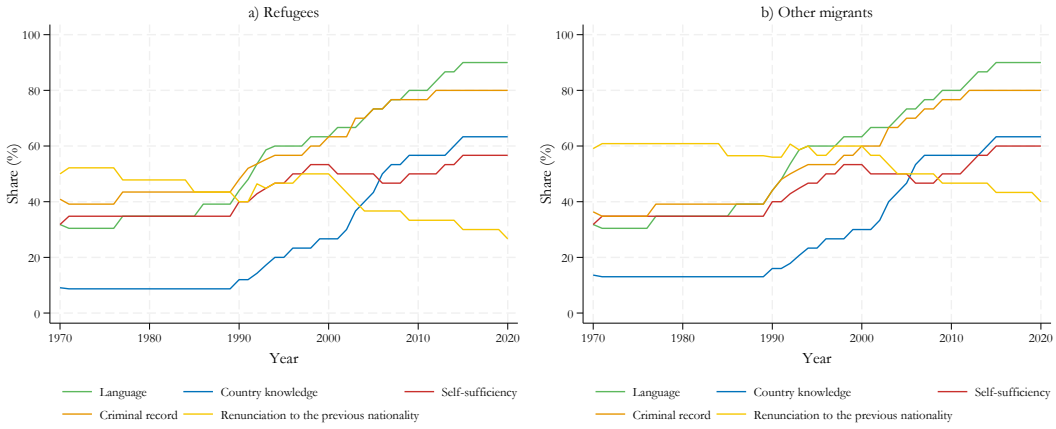
A.1 Appendix Figures

Figure A.1: Weighted Average Residence Requirements for Naturalization



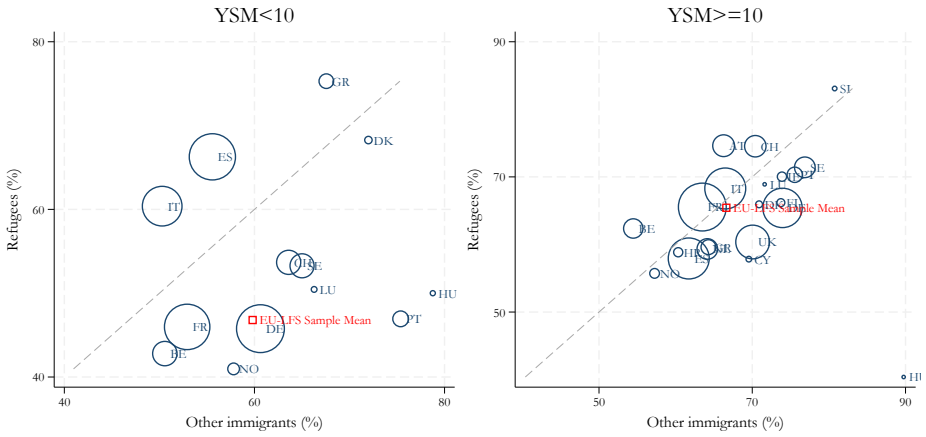
Note: The figure reports the evolution over time of the minimum years of residency requirement for refugees' (Panel a) and other migrants' (Panel b) eligibility for naturalization. Each light line refers to a different European country. The darker lines report the weighted mean value across all countries, where each country-year weight is proportional to the number of migrants included in the sample. Source: authors' elaborations on data from GLOBALCIT Citizenship Law Dataset, v1.0; Global Databases on Modes of Acquisition and Loss of Citizenship; country reports of the Global Citizenship Observatory.

Figure A.2: Share of Countries with Additional Requirements for Naturalization, by type of requirement



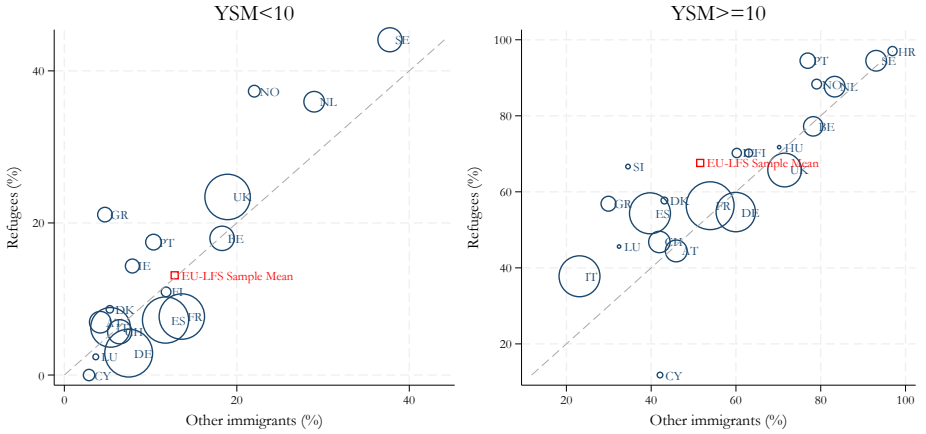
Note: The figure reports the evolution over time of the share of European countries imposing a certain type of requirement for refugees' (Panel a) and other migrants' (Panel b) eligibility for naturalization. Source: authors' elaborations on data from GLOBALCIT Citizenship Law Dataset, v1.0; Global Databases on Modes of Acquisition and Loss of Citizenship; country reports of the Global Citizenship Observatory.

Figure A.3: Share of Employed Individuals among Refugees and Other Migrants



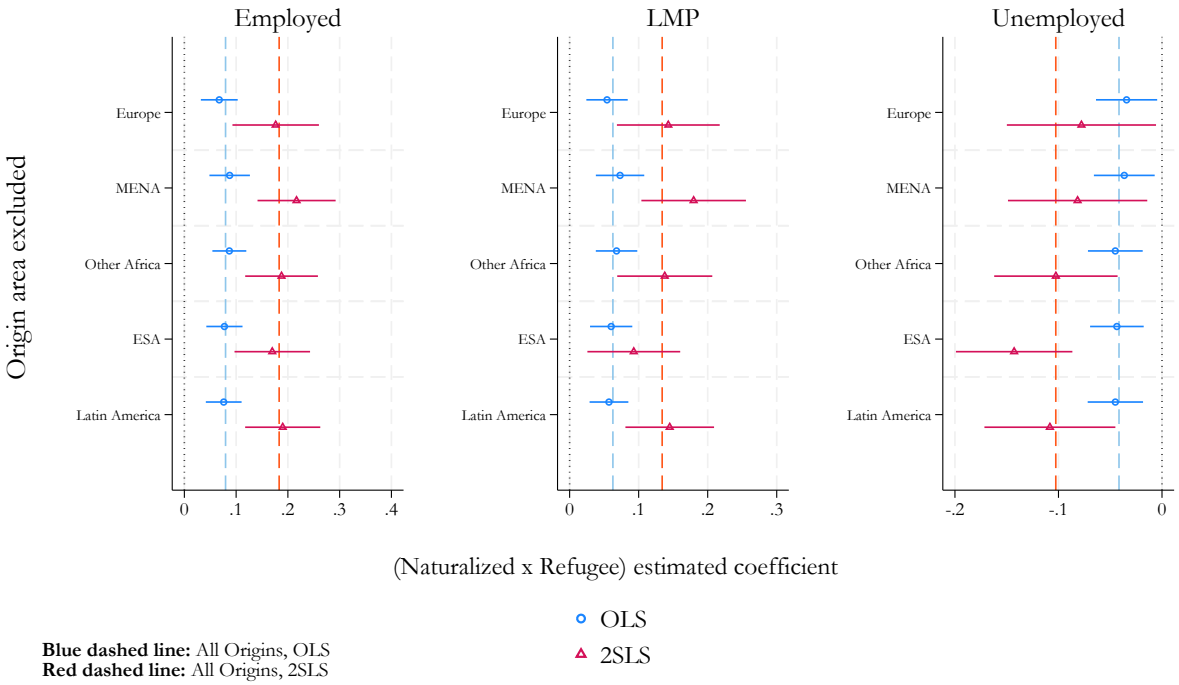
Note: The figure reports the share of refugees (vertical axis) and other migrants (horizontal axis) who are employed, by host country. Sample: foreign-born individuals who have been in the current country for less than ten years (left panel) and for ten years or more (right panel). Each circle's size is proportional to each country's foreign-born population. Source: authors' elaborations from EU-LFS 2008, 2014, and 2021.

Figure A.4: Share of Naturalized Individuals among Refugees and Other Migrants



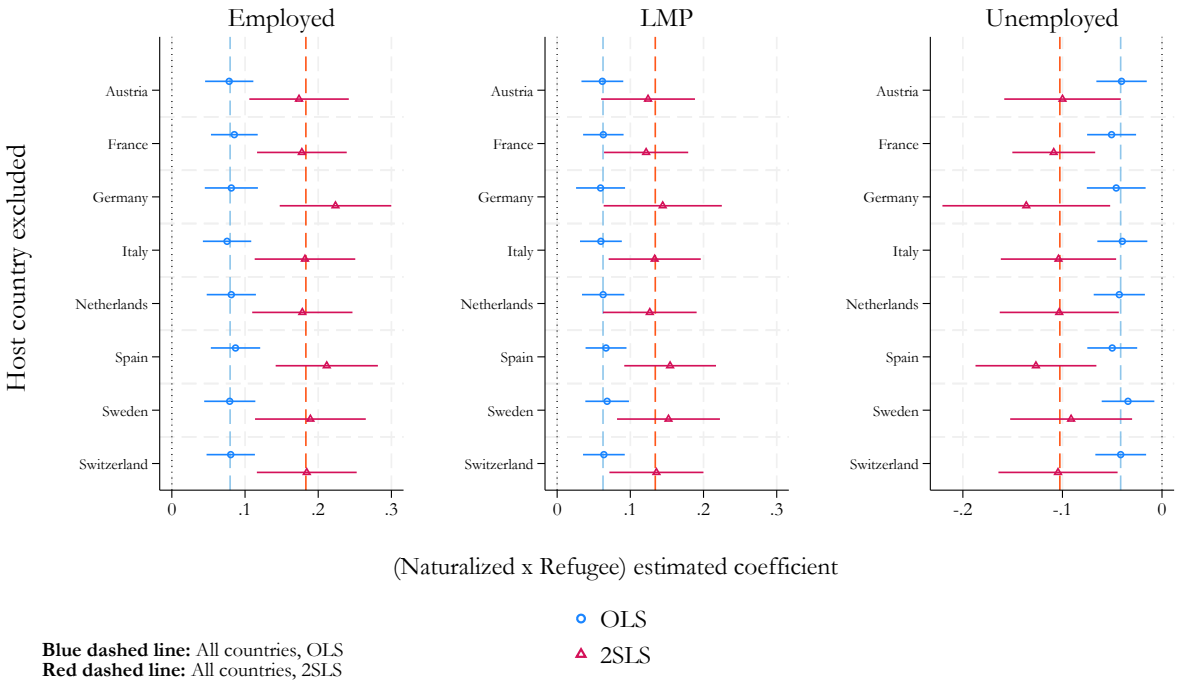
Note: The figure reports the share of refugees (vertical axis) and other migrants (horizontal axis) who are citizens of their current country of residence, by host country. Sample: foreign-born individuals who have been in the current country for less than ten years (left panel) and for ten years or more (right panel). Each circle's size is proportional to each country's foreign-born population. Source: authors' elaborations from EU-LFS 2008, 2014, and 2021.

Figure A.5: Robustness Checks - Leave-One-Out: Origin Areas



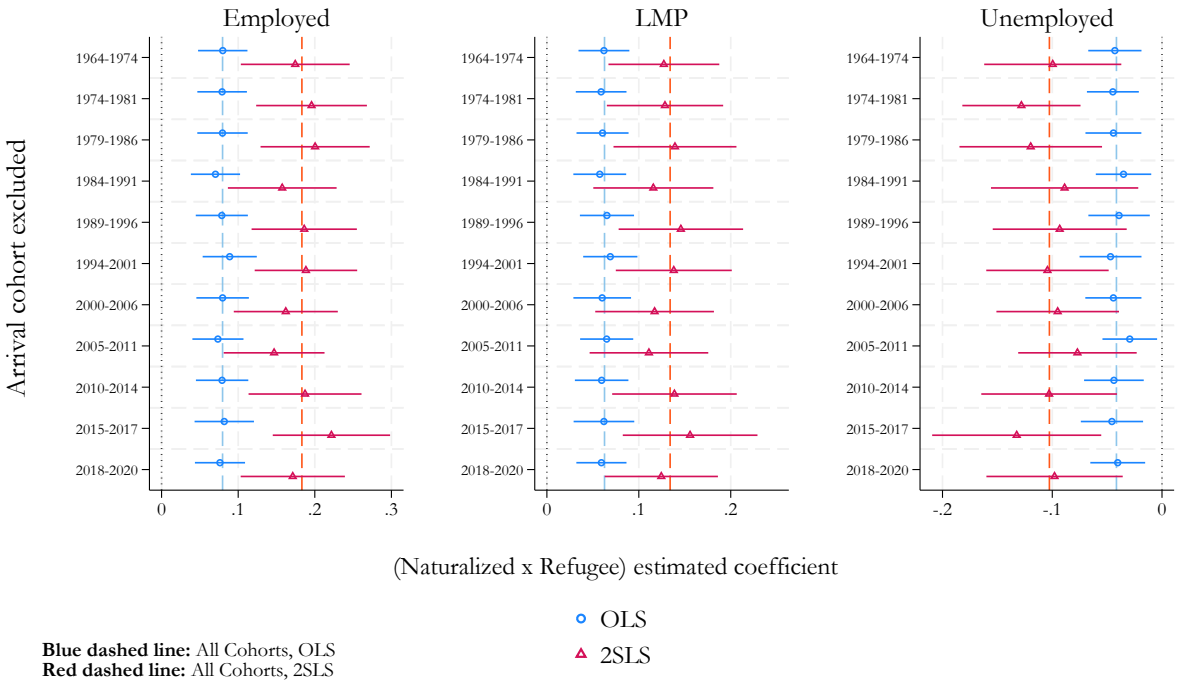
Note: The figure reports the estimates for the coefficient on the interaction of a refugee dummy with a naturalized dummy in OLS (blue circle) and 2SLS (red triangle) regressions of a dummy for employment on a dummy for being naturalized, a refugee dummy, and their interaction in regressions where each area of origin is alternatively dropped. The vertical blue (red) line indicates OLS (2SLS) estimates for the whole sample for reference. All regressions also include controls for the interaction of year and host country dummies; a set of dummies for five-year age brackets and primary, secondary, or tertiary education; dummies for each macro-area of origin; a set of dummies that identify each year since migration until ten and then five-year intervals of years since migration for values above ten. In 2SLS regressions, the variables "Naturalized" and "Naturalized x Refugee" are instrumented with "Years of Eligibility" and the interaction "Years of Eligibility x Refugee". "Years of Eligibility" is defined as the difference between years since migration and the minimum number of years of residence required for naturalization if the difference is positive and zero otherwise. Standard errors clustered at the YSM-host country level (345 clusters) in 2SLS regressions.

Figure A.6: Robustness Checks - Leave-One-Out: Main Host Countries



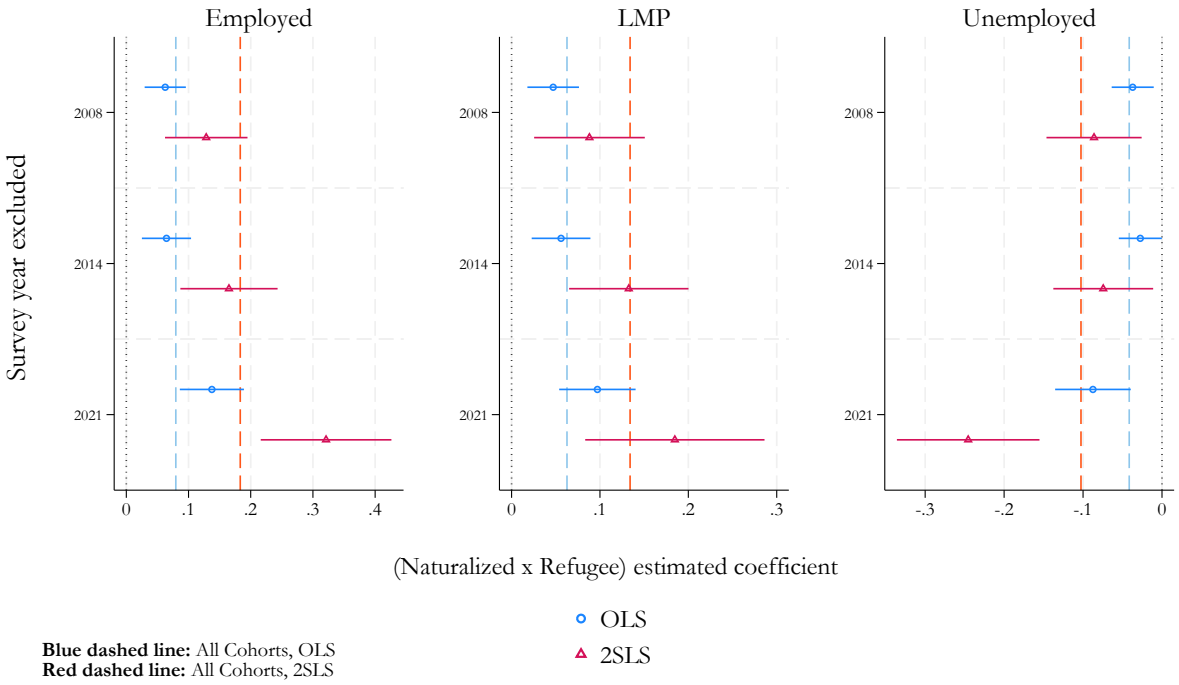
Note: The figure reports the estimates for the coefficient on the interaction of a refugee dummy with a naturalized dummy in OLS (blue circle) and 2SLS (red triangle) regressions of a dummy for employment on a dummy for being naturalized, a refugee dummy, and their interaction in regressions where each of the top eight countries of residence is alternatively dropped. The vertical blue (red) line indicates OLS (2SLS) estimates for the whole sample for reference. All regressions also include controls for the interaction of year and host country dummies; a set of dummies for five-year age brackets and primary, secondary, or tertiary education; dummies for each macro-area of origin; a set of dummies that identify each year since migration until ten and then five-year intervals of years since migration for values above ten. In 2SLS regressions, the variables "Naturalized" and "Naturalized x Refugee" are instrumented with "Years of Eligibility" and the interaction "Years of Eligibility x Refugee". "Years of Eligibility" is defined as the difference between years since migration and the minimum number of years of residence required for naturalization if the difference is positive and zero otherwise. Standard errors clustered at YSM-host country level in 2SLS regressions.

Figure A.7: Robustness Checks - Leave-One-Out: Entry Cohorts



Note: The figure reports the estimates for the coefficient on the interaction of a refugee dummy with a naturalized dummy in OLS (blue circle) and 2SLS (red triangle) regressions of a dummy for employment on a dummy for being naturalized, a refugee dummy, and their interaction in regressions where one cohort of entry is alternatively dropped. Note that, in each of the three survey years, year of entry in the host country is recorded precisely for the ten previous years, and then grouped in five-years groups. As a result, we cannot define the same entry cohorts across the three survey years, hence the interval of years used to define cohorts in this graph are partly overlapping, for earlier entry cohorts. The vertical blue (red) line indicates OLS (2SLS) estimates for the whole sample for reference. All regressions also include controls for the interaction of year and host country dummies; a set of dummies for five-year age brackets and primary, secondary, or tertiary education; dummies for each macro-area of origin; a set of dummies that identify each year since migration until ten and then five-year intervals of years since migration for values above ten. In 2SLS regressions, the variables "Naturalized" and "Naturalized x Refugee" are instrumented with "Years of Eligibility" and the interaction "Years of Eligibility x Refugee". "Years of Eligibility" is defined as the difference between years since migration and the minimum number of years of residence required for naturalization if the difference is positive and zero otherwise. Standard errors clustered at YSM-host country level in 2SLS regressions.

Figure A.8: Robustness Checks - Leave-One-Out: Survey Years



Note: The figure reports the estimates for the coefficient on the interaction of a refugee dummy with a naturalized dummy in OLS (blue circle) and 2SLS (red triangle) regressions of a dummy for employment on a dummy for being naturalized, a refugee dummy, and their interaction in regressions where each survey year is alternatively dropped. The vertical blue (red) line indicates OLS (2SLS) estimates for the whole sample for reference. All regressions also include controls for the interaction of year and host country dummies; a set of dummies for five-year age brackets and primary, secondary, or tertiary education; dummies for each macro-area of origin; a set of dummies that identify each year since migration until ten and then five-year intervals of years since migration for values above ten. In 2SLS regressions, the variables "Naturalized" and "Naturalized x Refugee" are instrumented with "Years of Eligibility" and the interaction "Years of Eligibility x Refugee". "Years of Eligibility" is defined as the difference between years since migration and the minimum number of years of residence required for naturalization if the difference is positive and zero otherwise. Standard errors clustered at YSM-host country level in 2SLS regressions.

A.2 Appendix Tables

Table A.1: EULFS Sample: by Host Country and Survey Year

Survey Year	2008	2014	2021	Total
AT Austria	1218	2077	11047	14342
BE Belgium	800	1248	2160	4208
CH Switzerland	4606	1064	6967	12637
CY Cyprus	635	714	3859	5208
DE Germany	0	0	11335	11335
DK Denmark	0	0	2221	2221
ES Spain	0	3240	3857	7097
FI Finland	0	306	503	809
FR France	1691	1415	3252	6358
GR Greece	2316	0	738	3054
HR Croatia	0	285	955	1240
HU Hungary	0	0	836	836
IE Ireland	814	0	1023	1837
IT Italy	0	6135	23948	30083
LU Luxembourg	263	505	425	1193
NL Netherlands	3106	0	4352	7458
NO Norway	432	596	290	1318
PT Portugal	817	1313	466	2596
SE Sweden	1364	1035	6951	9350
SI Slovenia	0	272	1984	2256
UK United Kingdom	2612	3622	0	6234
Total	20674	23827	87169	131670

Note: The table reports the number of observations in our sample for each country and survey year. Sample: working age (20–64) individuals, born outside of the EU, North America, or Oceania, in the current country for no more than 44 years, not in full-time education or military service, with non-missing information on the main reason for migration. Only country-year pairs with at least twenty refugees among the respondents are included. Data: EULFS 2008, 2014, 2021.

Table A.2: First Stage Regressions

VARIABLES	(1) Naturalized FS	(2) Nat. x Ref. FS	(3) Naturalized FS	(4) Nat. x Ref. FS
Years of eligibility	0.024***	-0.008***	0.023***	-0.010***
	[0.003]	[0.002]	[0.003]	[0.002]
Years of eligibility x Refugee	0.003***	0.027***	0.002*	0.027***
	[0.001]	[0.002]	[0.001]	[0.002]
Refugee	-0.045***	0.188***	-0.034*	0.219***
	[0.016]	[0.030]	[0.018]	[0.033]
Observations	131,670	131,670	99,291	99,291
Year x Host Country FE	Yes	Yes	Yes	Yes
Age Gender Education FE	Yes	Yes	Yes	Yes
Origin Area FE	Yes	Yes	Yes	Yes
YSM FE	Yes	Yes	Yes	Yes
F-stat	37.71	106.5	28.80	103.4

Note: The table reports first stage regressions: the variables "Naturalized" (columns 1 and 3) and "Naturalized x Refugee" (columns 2 and 4) are instrumented with "Years of Eligibility" and with the interaction "Years of Eligibility x Refugee". "Years of Eligibility" is defined as the difference between years since migration and the minimum number of years of residence required for naturalization if the difference is positive and zero otherwise. We use the full sample in columns 1–2 and restrict it to the sub-sample of active workers in columns 3–4. All regressions include "Year x Host Country FE", the interaction of year and host country dummies; "Age Gender Education FE", a set of dummies for five-year age brackets, female and primary, secondary or tertiary education; "Origin area FE", dummies for each macro-area of origin; "YSM FE", a set of dummies that identify each year since migration until ten and then five-year intervals of years since migration for values above ten. Standard errors clustered at YSM-host country level (345 clusters): *** p<0.01, ** p<0.05, * p<0.1

Table A.3: Naturalization and Labor Market Outcomes, by Gender (2SLS)

VARIABLES	(1) empl 2SLS F	(2) empl 2SLS M	(3) lmp 2SLS F	(4) lmp 2SLS M	(5) unempl 2SLS F	(6) unempl 2SLS M
Naturalized	0.156	-0.048	0.132	-0.019	-0.101	0.058
	[0.152]	[0.085]	[0.147]	[0.066]	[0.126]	[0.065]
Refugee	-0.179***	-0.191***	-0.154***	-0.151***	0.112***	0.081***
	[0.029]	[0.024]	[0.028]	[0.020]	[0.039]	[0.019]
Naturalized x Refugee	0.204***	0.231***	0.172***	0.178***	-0.140**	-0.106***
	[0.054]	[0.039]	[0.047]	[0.035]	[0.066]	[0.029]
Observations	70,252	61,418	70,252	61,418	45,672	53,619
Year x Host Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Age Education FE	Yes	Yes	Yes	Yes	Yes	Yes
Origin Area FE	Yes	Yes	Yes	Yes	Yes	Yes
YSM FE	Yes	Yes	Yes	Yes	Yes	Yes
Avg Out.: Non-Nat. Migrants	0.524	0.780	0.620	0.883	0.155	0.117
F-stat: naturalized	30.79	35.78	30.79	35.78	16.70	35.11
F-stat: naturalized x refugee	98.56	105.9	98.56	105.9	81.57	106.5

Note: Each column reports results from separate 2SLS regressions for women (odd columns) and men (even columns) of dummies for employment (columns 1-2), labor market participation (columns 3-4) or unemployment (columns 5-6) on a dummy for being naturalized, a refugee dummy, and their interaction. All regressions include "Year x Host country FE", the interaction of year and host country dummies; "Age and Education", a set of dummies for five-year age brackets and for primary, secondary, or tertiary education; "Origin area FE", dummies for each macro-area of origin; "YSM FE", a set of dummies that identify each year since arrival in the host country until ten years of residence, and five-year intervals thereafter. The variables "Naturalized" and "Naturalized x Refugee" are instrumented with "Years of Eligibility" and the interaction "Years of Eligibility x Refugee". "Years of Eligibility" is defined as the difference between years since migration and the minimum number of years of residence required for naturalization if the difference is positive and zero otherwise. Standard errors clustered at the YSM-host country level (345 clusters). *** p<0.01, ** p<0.05, * p<0.1

Table A.4: Naturalization and Labor Market Outcomes, by Education Level (2SLS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	empl	empl	empl	lmp	lmp	lmp	unempl	unempl	unempl
VARIABLES	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
Naturalized	0.014	0.163	0.047	0.031	0.052	0.210	0.030	-0.140	0.218
	[0.126]	[0.188]	[0.159]	[0.106]	[0.151]	[0.164]	[0.116]	[0.145]	[0.171]
Refugee	-0.123***	-0.177***	-0.191***	-0.104***	-0.135***	-0.119***	0.063**	0.088***	0.114***
	[0.027]	[0.036]	[0.042]	[0.022]	[0.034]	[0.041]	[0.026]	[0.026]	[0.031]
Naturalized x Refugee	0.094	0.238***	0.188***	0.085*	0.158***	0.116**	-0.039	-0.143***	-0.116**
	[0.059]	[0.057]	[0.054]	[0.049]	[0.052]	[0.054]	[0.059]	[0.044]	[0.046]
Observations	52,462	45,638	33,570	52,462	45,638	33,570	35,367	36,171	27,753
Year x Host Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age Gender FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Origin Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YSM FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education Level	Prim.	Sec.	Tert.	Prim.	Sec.	Tert.	Prim.	Sec.	Tert.
Avg Out.: Non-Nat. Migrants	0.576	0.682	0.708	0.680	0.785	0.793	0.153	0.131	0.107
F-stat: Naturalized	52.08	13.37	10.39	52.08	13.37	10.39	27.49	14.15	7.944
F-stat: Naturalized x Refugee	108.6	70.71	96.94	108.6	70.71	96.94	129.7	61.94	85.67

Note: Each column reports results from separate 2SLS regressions by education level (low, columns 1, 4, 7; intermediate, columns 2, 5, 8; high, columns 3, 6, 9) of dummies for employment (columns 1–3), labor market participation (columns 4–6) or unemployment (columns 7–9) on a dummy for being naturalized, a refugee dummy, and their interaction. All regressions include "Year x Host country FE", the interaction of year and host country dummies; "Age and Gender", a set of dummies for five-year age brackets and for primary, secondary, or tertiary education; "Origin area FE", dummies for each macro-area of origin; "YSM FE", a set of dummies that identify each year since arrival in the host country until ten years of residence, and five-year intervals thereafter. The variables "Naturalized" and "Naturalized x Refugee" are instrumented with "Years of Eligibility" and the interaction "Years of Eligibility x Refugee". "Years of Eligibility" is defined as the difference between years since migration and the minimum number of years of residence required for naturalization if the difference is positive and zero otherwise. Standard errors clustered at the YSM-host country level (345 clusters). *** p<0.01, ** p<0.05, * p<0.1

Table A.5: Naturalization and Employment: Additional FE (2SLS)

VARIABLES	(1) empl 2SLS	(2) empl 2SLS	(3) empl 2SLS	(4) empl 2SLS	(5) empl 2SLS	(6) empl 2SLS	(7) empl 2SLS
Naturalized	0.043	0.010	0.027	-0.014	0.049	-0.011	-0.004
	[0.098]	[0.101]	[0.103]	[0.108]	[0.100]	[0.087]	[0.093]
Refugee	-0.164***	-0.168***	-0.184***	-0.190***	-0.167***	-0.141***	-0.144***
	[0.021]	[0.020]	[0.022]	[0.021]	[0.022]	[0.019]	[0.020]
Naturalized x Refugee	0.183***	0.184***	0.214***	0.220***	0.188***	0.142***	0.145***
	[0.034]	[0.033]	[0.037]	[0.037]	[0.035]	[0.032]	[0.032]
Observations	131,670	131,670	131,670	131,670	131,670	131,670	131,670
Baseline FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Origin Area x [Age Gender Education] FE	No	Yes	No	Yes	No	No	No
YSM x [Age Gender Education] FE	No	No	Yes	Yes	No	No	No
Origin Area x Host Country FE	No	No	No	No	Yes	No	Yes
Origin Area x Year FE	No	No	No	No	Yes	No	Yes
YSM x Origin Area FE	No	No	No	No	No	Yes	Yes
YSM x Year FE	No	No	No	No	No	Yes	Yes
F-stat: Naturalized	37.71	33.85	42.39	38.49	35.66	29.90	28.63
F-stat: Naturalized x Refugee	106.5	109.6	108.9	111.8	114.1	109.1	112.6
Avg Out.: Non-Nat. Migrants	0.641	0.641	0.641	0.641	0.641	0.641	0.641

Note: Each column reports results from separate 2SLS regressions of dummies for being employed on a dummy for being naturalized, a refugee dummy, and their interaction. "Baseline FE" include all fixed effects and their interaction used in our main specification (see Table 4): "Year x Host country FE", "Age Gender Education FE", "Origin Area FE", "YSM FE". Column 1 reports estimates that exclusively condition on this set of baseline fixed effects (estimates are identical to those displayed in column 1 of Table 4) while in the following columns we include additional sets of fixed effects interactions (as indicated in the Table). The variables "Naturalized" and "Naturalized x Refugee" are instrumented with "Years of Eligibility" and the interaction "Years of Eligibility x Refugee". "Years of Eligibility" is defined as the difference between years since migration and the minimum number of years of residence required for naturalization if the difference is positive and zero otherwise. Standard errors clustered at the YSM-host country level (345 clusters). *** p<0.01, ** p<0.05, * p<0.1

Table A.6: Respondents Exposed to Changes in Naturalization Requirements

	Duration or residence requirement:			
	decrease	no change	increase	Total
Other requirements:				
decrease	1,039	1,718	0	2,757
no change	2,717	105,955	2,107	110,779
increase	7,144	8,696	2,294	18,134
Total	10,900	116,369	4,401	131,670

Note: The table reports the number of individuals in the sample who experienced a decrease (column 2), no change (column 3), or an increase (column 4) in minimum residency requirements for naturalization after their arrival in the host country but before satisfying the original residency requirement, who also experienced a decrease (row 1), no change (row 2), or an increase (row 3) in the number of additional requirements for naturalization.

Table A.7: Naturalization and Occupational Quality - OLS estimates

VARIABLES	(1) high_skill	(2) low_skill	(3) superv_role	(4) large_firm	(5) full_time	(6) hours_work	(7) more_hours	(8) perm_job	(9) selfempl	(10) overqual
Naturalized	0.035***	-0.044***	0.027***	0.051***	0.024***	0.531***	-0.016***	0.030***	-0.014***	-0.026*
	[0.006]	[0.006]	[0.006]	[0.008]	[0.006]	[0.169]	[0.006]	[0.006]	[0.005]	[0.015]
Refugee	-0.105***	0.057***	-0.054***	-0.057***	-0.053***	-1.276***	0.056***	-0.047***	-0.007	0.114***
	[0.011]	[0.014]	[0.008]	[0.015]	[0.012]	[0.303]	[0.012]	[0.013]	[0.008]	[0.037]
Naturalized x Refugee	0.044***	-0.016	0.024*	0.015	0.023	0.444	-0.037**	0.050***	0.025**	-0.054
	[0.015]	[0.018]	[0.013]	[0.020]	[0.015]	[0.414]	[0.015]	[0.015]	[0.011]	[0.047]
Observations	86,163	86,163	76,651	74,560	86,511	85,181	85,881	76,767	86,605	14,514
Year x Host Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age Gender Education FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Origin Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YSM FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avg Outcome: Non-Nat. Migrants	0.202	0.389	0.126	0.319	0.769	36.73	0.144	0.794	0.101	0.329

Note: Each column reports results from separate OLS regressions of different variables capturing job quality on a dummy for being naturalized, a refugee dummy, and their interaction. The dependent variables are: a dummy for having a high- (ISCO codes 1, 2, 3) or low- (ISCO code 9) skilled job (columns 1 and 2 respectively); dummies for having a supervisory role (column 3), working in a firm with 50 or more employees (column 4), working full time (column 5), willing to work more hours than currently (column 7), having a permanent job (column 8), being self-employed (column 9), feeling over-qualified (column 10); the number of weekly working hours (column 6). All regressions include "Year x Host country FE", the interaction of year and host country dummies; "Age Gender Education", a set of dummies for five-year age brackets, female and primary, secondary or tertiary education; "Origin area FE", dummies for each macro-area of origin; "YSM FE", a set of dummies that identify each year since arrival in the host country until ten years of residence, and five-year intervals thereafter. The sample includes refugees and other migrants from outside the EU, North America, and Oceania who are in employment. Robust standard errors are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

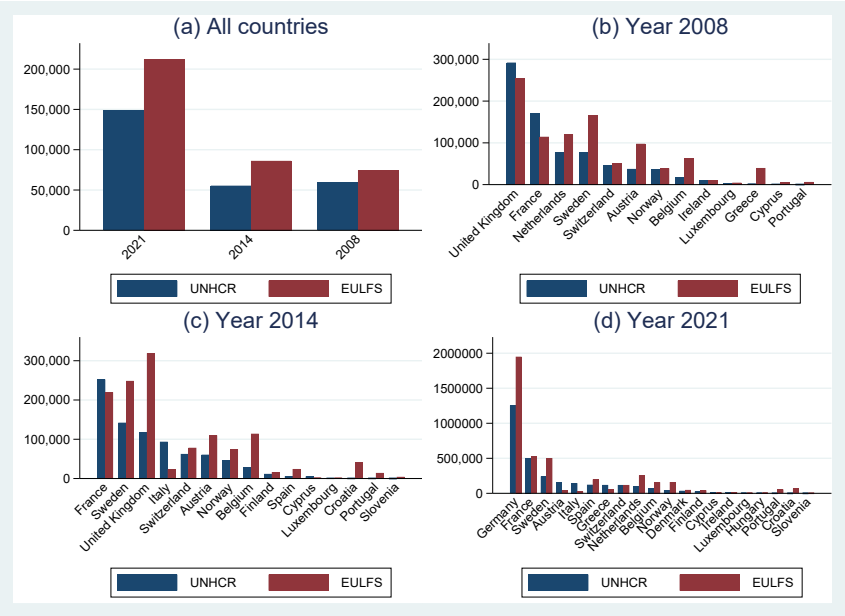
A.3 EULFS Validation

In our analysis, we are interested in separately identifying immigrants who entered the country to seek international protection and those who entered for other reasons. We do so using the variable MIGREAS, which is available in the EULFS modules on the labor market situation of migrants and their immediate descendants in 2008, 2014, and 2021. The variable records information on the main reason for migration of respondents, not on their current status nor their status when they first entered the country. Note that the current administrative status of migrants may change over time, thus the reason for migration does not necessarily map one-to-one with the type of residence permit held. For recently arrived migrants, the administrative status will (in most cases) reflect the main reason for migration. However, the longer the time spent in the host country, the more likely it is that migrants change their administrative status, for instance because they become permanent residents or naturalize. Thus, if the MIGREAS variable credibly identifies the cumulative number of individuals who entered the country as refugees, then the number of refugees measured from the EULFS in any given year should be in general higher than the contemporaneous stock of valid refugee permits issued in a country. In this Appendix, we provide evidence that this is the case, and that the reason-for-migration variable can be therefore reliably used to identify individuals who entered the country as refugees.

Panel (a) in Figure A.9 compares - for each of the three survey years considered and pooling all countries available in each year - the stock of current refugees recorded by UNCHR to the estimated number of foreign-born individuals in the EULFS that state "international protection" as their main reason for migration (the estimate is obtained using sample weights). It shows that the two measures are correlated although the former is always lower than the latter, as expected.

The remaining panels of Figure A.9 perform the same exercise for each survey year (2008 - (b); 2014 - (c); 2021 - (d)), reporting separate estimates for each available country. These additional panels confirm that UNHCR and EULFS estimates are roughly aligned. However, the former tend to be lower than the latter, as expected (the only exceptions are the UK in 2008, France in 2008 and 2014, Italy in 2014 and 2021, and Austria and Greece in 2021). Note that, beyond sampling errors, these exceptions can be driven also by secondary movements of refugees who reside in a different country than the one they are officially registered in.

Figure A.9: Number of refugees in European countries, UNHCR / EULFS comparison



Note: In each panel, blue bars report the stock of refugees recorded by UNHCR, and red bars indicate the stock of foreign-born residents who state international protection as their main reason for migration estimated from the EULFS. Panel a pools all available countries in each survey year, reported on the horizontal axis. Panels b, c, and d display the two estimates by country in 2008, 2014, and 2021, respectively.

A.4 Marginal Treatment Effects

A.4.1 Theoretical Framework

Outcome equation. Following the standard MTE framework (Carneiro et al. 2011, Cornelissen et al. 2016), we define the (labor market) outcomes in the untreated and treated state (i.e. without and with the "citizenship" treatment C_i) of individual i with Y_{0i} and Y_{1i}, respectively. We model these potential outcomes as:

$$Y_{0i} = \mu_0(X_i) + U_{0i} \quad \text{if} \quad C_i = 0 \tag{A.1}$$

$$Y_{1i} = \mu_1(X_i) + U_{1i} \quad \text{if} \quad C_i = 1 \tag{A.2}$$

assuming - as it is common in the applied MTE literature - linear separability of the potential outcome Y_{ji} in its conditional mean given the observables X_i in treatment state j ($\mu_j(X_i)$; with $j = 0, 1$) and in the individual deviations from that mean (U_{ji}; with $E[U_{ji}|X_i] = 0$). The observed outcome Y_i is given by:

$$Y_i = C_i Y_{1i} + (1 - C_i)Y_{0i} = Y_{0i} + (Y_{1i} - Y_{0i})C_i \tag{A.3}$$

The individual treatment effect is thus defined as:

$$\Delta_i = Y_{1i} - Y_{0i} = (\mu_1(X_i) - \mu_0(X_i)) + (U_{1i} - U_{0i}) \tag{A.4}$$

showing that treatment effect heterogeneity may result from both observed characteristics $(\mu_1(X_i) - \mu_0(X_i))$ and unobserved characteristics $(U_{1i} - U_{0i})$. Assuming that the potential outcomes are linear in parameters, we can write the conditional means as $\mu_j(X_i) = X_i\beta_j$ and estimate:

$$Y_{ji} = X_i\beta_j + U_{ji} \qquad \text{for} \qquad j = 0, 1 \tag{A.5}$$

where $E[U_{ji}|X_i] = 0$ if we interpret equation (A.5) as a linear projection of Y_{ji} on X_i (see Brinch et al. (2017) and Cornelissen et al. (2018)). The individual gains from treatment can be rewritten as:

$$\Delta_i = Y_{1i} - Y_{0i} = X_i(\beta_1 - \beta_0) + (U_{1i} - U_{0i}) \tag{A.6}$$

Selection into treatment. The process of selection into the naturalization treatment C_i can be modelled with the following latent index model:

$$C_i^* = Z_i\gamma_c - V_i \tag{A.7}$$

where C_i^* is the utility from becoming a host country citizen and $Z = (X, \tilde{Z})$ includes the same controls X as the outcome equation and an instrument $\tilde{Z}$ excluded from the outcome equation. The error term V_i enters the selection equation with a negative term and captures all unobservables that make individuals less likely to naturalize (i.e., to receive the treatment). In the MTE framework, V_i is generally labeled "unobserved resistance" to treatment. In our setting, this variable captures any determinant - unobservable or unobserved in our data - that reduces the probability of naturalizing, conditional on observable characteristics.

Without loss of generality, we assume that individuals will take the treatment if the utility from doing so is larger than zero:

$$C_i = 1 \quad \text{if} \qquad C_i^* \geq 0, \qquad C_i = 0 \quad \text{otherwise} \tag{A.8}$$

Hence, we can write:

$$C_i^* \geq 0 \Rightarrow Z_i\gamma_c - V_i \geq 0 \Rightarrow Z_i\gamma_c \geq V_i \Rightarrow \Phi(Z_i\gamma_c) \geq \Phi(V_i) \tag{A.9}$$

where Φ denotes the cdf of V_i, which we assume to be a standard normal distribution (in our main estimates, we will use a probit to estimate the selection equation; see section 7). Note that $\Phi(Z_i\gamma_c) = P(Z_i)$ is the propensity score, that is, the probability that an individual with observed characteristics Z will receive the citizenship treatment (the *"observed encouragement"*), while $\Phi(V_i) = W_D$ are quantiles of the distribution of *unobserved resistance* to treatment (and W_D, by construction, has a uniform distribution in the population). The

treatment choice decision can now be written as:

$$C_i = 1 \quad \text{if} \qquad P(Z_i) \geq W_D, \qquad C_i = 0 \quad \text{otherwise} \tag{A.10}$$

that is, the treatment is chosen if the individual *observed encouragement* exceeds the *unobserved resistance*.

Marginal Treatment Effect. The marginal treatment effect as a function of the quantiles W_D can then be expressed as:

$$MTE(X = x, W_D = w_D) = E(Y_1 - Y_0 | X = x, W_D = w_D) \tag{A.11}$$

where MTE is the gain from treatment for an individual with observed characteristics $X = x$ who is in the $w_D th$ quantile of the V distribution (note that this individual is indifferent to receiving treatment when having a propensity score $P(Z) = w_D$).

A.4.2 Selection Equation: Estimation Results

Appendix Table A.8 report results from estimating our selection (or first stage) equation in which the dummy for being naturalized is regressed on all individual controls, fixed effects, and on the "years of eligibility" instrument. The Table reports estimates obtained from alternative estimators: probit with two instruments (years of eligibility variable and its interaction with a refugee dummy; column 1); probit with one instrument (years of eligibility; column 2); logit and LPM (with two instruments; columns 3 and 4).

A.4.3 Robustness Checks

Common Support. Appendix Figure A.10 displays common support graphs for alternative first-stage estimators.

Alternative FS estimators. Our baseline specification uses a probit model for the first stage, a popular choice in the applied MTE literature. To test whether this specific choice may be driving our results, we re-estimate MTE profiles using logit and LPM estimators in the first stage (common support graphs for these alternative estimators are reported in Appendix Figure A.10). Figure A.11 contrasts estimated MTE for each of the three main labor outcomes predicting propensity scores using alternative first-stage estimators. In all cases, the MTE curves obtained from Probit and Logit first stages are almost overlapping; the profile obtained with an LPM first stage is slightly different, but its slope is consistent with that of the other two estimators. This evidence suggests that the shape of the MTE curves is not determined by the functional form of the first stage.

Alternative polynomials. Further, we investigate the sensitivity of our estimates to the

second-stage functional form by varying the polynomial order from 2 to 4. Our baseline specification includes the propensity score and its square, implying a linear MTE curve. We can allow for more sophisticated patterns of the MTE curve by including a cubic and a quartic of the propensity score. As Figure A.12 shows, the shape of the MTE curves for the three labor market outcomes is fairly similar across alternative specifications (except for support sections where the propensity score approaches its extreme values).

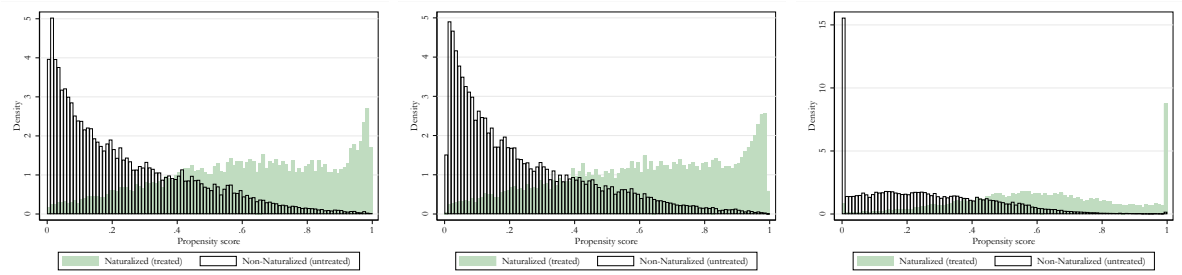
Restricted models. In our baseline specification, we have interacted all controls with the propensity score, flexibly allowing for heterogeneous effects across all possible observable dimensions. We now adopt a more parsimonious specification that closely resembles the baseline specification in Cornelissen et al. (2018) (they interact the propensity score with female and minority dummies) and exclusively include the interactions with gender and refugee status. MTE profiles for the three labor market outcomes estimated from this restricted model are reported in Figure A.13 and resemble those obtained from our baseline model.

Table A.8: Selection Equation: Naturalization Treatment

	(1)	(2)	(3)	(4)
	Probit - AME	Probit - AME	Logit - AME	LPM
VARIABLES	2 IVs	1 IV	2 IVs	2 IVs
Years of eligibility	0.014***	0.015***	0.013***	0.024***
	[0.003]	[0.003]	[0.003]	[0.003]
Years of eligibility x Refugee	0.004***		0.004***	0.003***
	[0.001]		[0.001]	[0.001]
Refugee	-0.046***	-0.004	-0.043**	-0.045***
	[0.018]	[0.013]	[0.018]	[0.016]
Observations	131,670	131,670	131,670	131,670
Year x Host Country FE	Yes	Yes	Yes	Yes
Age Gender Education FE	Yes	Yes	Yes	Yes
Origin Area FE	Yes	Yes	Yes	Yes
YSM FE	Yes	Yes	Yes	Yes

Note: The table reports results from estimating the selection into naturalization treatment. The outcome variable "Naturalized" - a dummy taking value one if the individual has naturalized and zero otherwise - is regressed on a set of individual characteristics and fixed effects and the instrument(s). In columns 1, 3, and 4, the "Naturalized" dummy is instrumented with $Years\ of\ Eligibility$ and with the interaction $Years\ of\ Eligibility \times Refugee$ (2 IVs), while in column 2 only with $Years\ of\ Eligibility$ (1 IV). $Years\ of\ Eligibility$ is defined as the difference between years since migration and the minimum number of years of residence required for naturalization if the difference is positive and zero otherwise. Estimates in different columns are obtained with alternative estimators: Probit (columns 1 and 2), Logit (column 3), and LPM (column 4). Average Marginal Effects are reported in Columns 1-3. All regressions include "Year x Host Country FE", the interaction of year and host country dummies; "Age Gender Education FE", a set of dummies for five-year age brackets, female and primary, secondary or tertiary education; "Origin area FE", dummies for each macro-area of origin; "YSM FE", a set of dummies that identify each year since arrival in the host country until ten years of residence, and five-year intervals thereafter. Standards errors clustered at entry cohort-host country level (157 clusters): *** p<0.01, ** p<0.05, * p<0.1

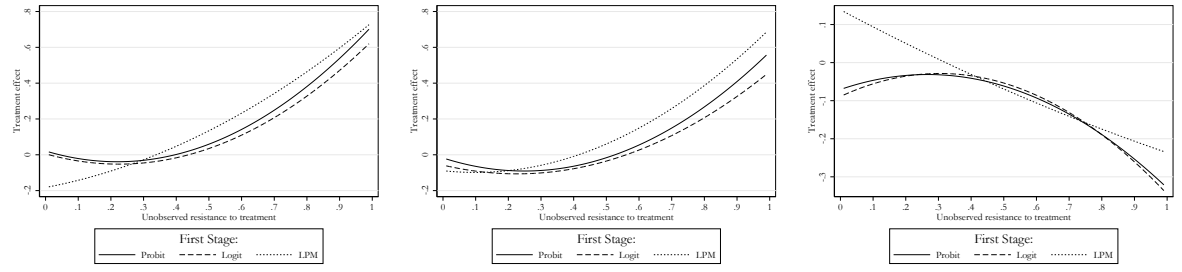
Figure A.10: Common Support: Robustness Checks



(a) Probit - 1 IV (b) Logit - 2 IVs (c) LPM - 2 IVs

Note: The Figure displays the propensity score distribution by treatment status. The propensity score is predicted from: (i) a probit regression (Panel A.10a); a logit regression (Panel A.10b); a Linear Probability Model (Panel A.10c; in this case, the bunching of propensity score at values zero and one is due to the replacement of negative predicted values with zeros and of predicted values larger than one with ones). In Panels A.10b and A.10c, the "Naturalized" dummy is instrumented with "Years of Eligibility" and with the interaction "Years of Eligibility x Refugee" (2 IVs), while in panel A.10a only with "Years of Eligibility" (1 IV). The propensity score is predicted from the regressions reported in columns 2-4 of Table A.8.

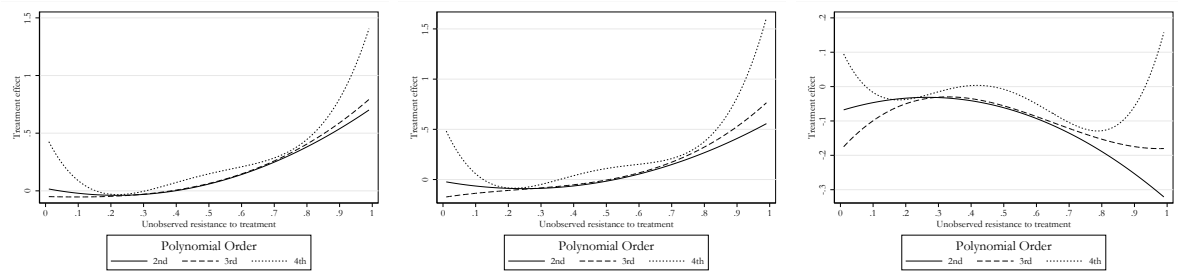
Figure A.11: MTE: Alternative First Stage Estimators



(a) Employment (b) LMP (c) Unemployment

Note: The Figure plots MTE curves at average values of the covariates for employment (panel A.11a), labor market participation (panel A.11b) and unemployment (panel A.11c). The estimated MTE are obtained from three alternative first-stage estimators: probit, logit, and LPM. The excluded instruments are the "years of eligibility" variable and its interaction with a refugee dummy. In the outcome equation, all controls are interacted with the propensity score (unrestricted model).

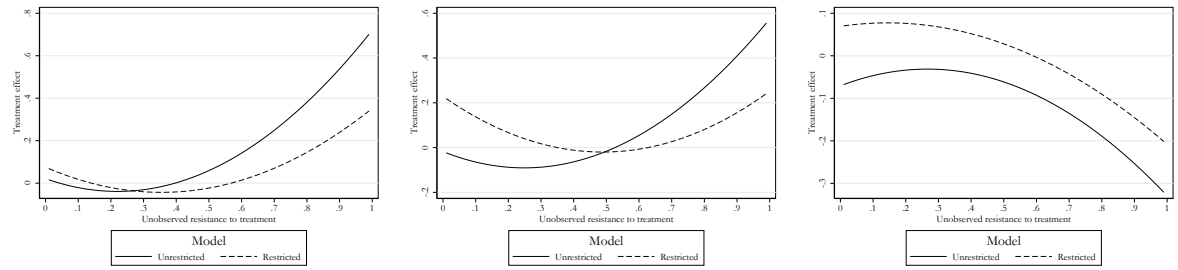
Figure A.12: MTE: Alternative Polynomials



(a) Employment (b) LMP (c) Unemployment

Note: The Figure plots MTE curves at average values of the covariates for employment (panel A.12a), labor market participation (panel A.12b) and unemployment (panel A.12c). The estimated MTE are obtained from our baseline model: (i) probit first stage; (ii) instruments: years of eligibility and its interaction with a refugee dummy; (iii) unrestricted model: all controls interacted with the propensity score. We estimate alternative MTE profiles by varying the polynomial order from 2 to 4.

Figure A.13: Marginal Treatment Effects: Unrestricted and Restricted model



(a) Employment (b) LMP (c) Unemployment

Note: The Figure plots MTE curves at average values of the covariates for employment (panel A.13a), labor market participation (panel A.13b) and unemployment (panel A.13c). The figure compares the MTE profiles estimated from our baseline model (unrestricted) with those obtained from the restricted model (which conditions on interaction terms of the propensity score exclusively with gender and refugee dummies). The first stage is estimated with a probit, and the excluded instruments are the "years of eligibility" variable and its interaction with a refugee dummy.