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Brexit and migration: evidence from Italy

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Abstract
A substantial body of research has examined the impact of the June 2016 Brexit referendum from a UK-centred perspective. Much of this literature has focused on economic and social outcomes, with particular attention to migration. In this paper, we evaluate the causal impact of the uncertainty generated by the referendum on migration from the standpoint of a major country of origin—Italy, one of the principal sources of intra-EU flows to the UK. Specifically, we investigate whether the referendum redirected emigration flows from Italy towards alternative destinations (the *migration diversion* hypothesis). Drawing on detailed Italian administrative migration data, we also explore whether uncertainty induced by the referendum differentially affected distinct groups of migrants: Italians by birth, who acquired citizenship, and other EU citizens residing in Italy. Finally, we assess whether the effect of Brexit varies by educational attainment among Italian-born emigrants—high, medium, and low skilled. To address these questions, we implement a difference-in-differences strategy in which EU citizens emigrating from Italy serve as the treatment group, while non-EU citizens emigrating from Italy provide the control group. The findings offer clear evidence of migration diversion, particularly among low-skilled Italians by birth.

Keywords Uncertainty, Migration diversion, Migration policy, Brexit, Italy, European Union

JEL Classification F22, J48, J61

Introduction

From the Brexit referendum in June 2016 to the end of negotiations in January 2020, the United Kingdom (UK) experienced a prolonged period of uncertainty that affected both long-established migrant communities and newly arrived migrants (Benson et al., 2022a). In the immediate aftermath of the referendum, the UK's future migration policy remained undefined (Ntampoudi, 2017; Owen, 2017), and only at the conclusion of the negotiations was it confirmed that a points-based immigration system would take effect in January 2021 (Sumption, 2022). While it is still too early to fully assess the implications of this new migration regime, the Brexit referendum offers a unique opportunity to investigate how policy uncertainty shapes migration behaviour.

This study examines the causal impact of the uncertainty generated by the Brexit referendum on migration outflows from Italy over the period 2012–2019. First, we test

whether this uncertainty reduced the attractiveness of the UK and redirected flows toward alternative destinations (the "*migration diversion*" hypothesis). Second, we assess whether the effects of Brexit-related uncertainty vary across different groups of citizens: Italians at birth, Italians who acquired citizenship (distinguished between those born abroad and those born in Italy), and other EU citizens. Finally, we analyse whether the Brexit referendum differentially affected Italian-born emigrants with high, medium, and low education levels.

A growing body of literature has explored the relationship between migration and uncertainty, recognising that uncertainty is intrinsic to migration decision-making (e.g., Hall et al., 2022; Williams and Balaz 2012). Only a few studies examined the migration effects of Brexit-induced uncertainty, primarily using Eurostat/OECD data (Auer & Tetlow, 2023; Di Iasio & Wahba, 2023; Hall et al., 2022). These studies analyse the consequences of Brexit from the country of destination perspective, the UK, a country that has significantly shaped intra-European Union (EU) mobility (Castro-Martín & Cortina, 2015) and has long been a major destination for EU citizens (Mooyaart & de Valk, 2020). Their main findings include: (*i*) an increase in emigration from the UK to other EU countries; (*ii*) a decline in inflows of EU citizens into the UK; and (*iii*) an increase in outflows of EU citizens from the UK. However, Di Iasio and Wahba (2023) find no evidence of migration diversion.

Much less is known about the effect of the Brexit referendum on the migratory behaviour of citizens from individual EU countries of origin —either those already residing in the UK or potential new emigrants. This gap motivates studies that examine the effect of referendum-induced uncertainty from the perspective of a country of origin. The case of Italy is particularly relevant, as this country has traditionally supplied the UK with a substantial share of skilled labour. Italy is consistently among the leading countries of origin for migration to the UK (ONS, 2021) and, since 2015, the UK has become the top destination for Italian emigrants, followed by Germany, France and Switzerland (Istat, 2019).

Italian population register data offer rich individual-level longitudinal information on migrants' origins, destinations, and characteristics—such as age, educational attainment, and citizenship status, distinguishing Italians at birth from naturalised Italians (born abroad or in Italy). This distinction is important because the migration behaviour of naturalised Italians differs from that of Italians at birth (Bonifazi et al., 2021; Strozza et al., 2021). These data also allow us to examine the impact of Brexit across different levels of education.[1] The strong educational selectivity of Italy–UK migration highlights the relevance of analysing skill composition. Although the effects on overall migration intensity may be modest, the educational profile of migrants can vary substantially. Moreover, the skill-selective immigration policy implemented in January 2021 reinforces the importance of studying migrants' educational levels, as the reform aimed to increase the share of highly educated and professionally qualified migrants (Sumption & Fernández-Reino 2018; Sumption, 2022).

In this paper, we analyse Italian emigration rates using a difference-in-differences framework in which Italians and other EU citizens emigrating from Italy constitute the treatment group (the only groups affected by the Brexit referendum and the

[1] There is a consensus in using the information on educational attainment to measure migrants' skills or competencies, as employers generally use formal education as a 'signal' for labor skills to reduce asymmetric information problems (Spence 1978).

ensuing uncertainty regarding immigration policy and migrant rights under the end of free movement), while non-EU migrants serve as the control group. Our findings provide the first evidence, from a country-of-origin perspective, of how migration-policy uncertainty can influence emigration intensity and shape the choices of migrants with different characteristics.

The remainder of the paper is structured as follows. Sect. "Background and research questions" reviews the literature on the migration effects of the Brexit referendum and outlines our hypotheses. Sect. "Italian emigration: some stylized facts" presents descriptive evidence on Italian emigration over the study period. Sect. "Data and methodology" describes the empirical strategy. Sect. "Estimation results" reports the econometric results. Section 6 concludes and discusses the implications.

Background and research questions

From the freedom of movement to Brexit

Over 33 million British citizens voted in the Brexit referendum, with the Leave campaign winning 51.9% of the vote against 48.1% for Remain. The results revealed a marked polarisation: support for Leave was particularly strong among British citizens aged 65 and over (64%) and those with low to medium levels of education (70%), whereas support for Remain was concentrated among young people aged 18–24 (71%) and university graduates (68%), predominantly living in large cities.[2]

Between the referendum vote in June 2016 and the UK's withdrawal from the EU in January 2020—followed by a transition period, formally ending on 31 December 2020, during which the UK remained bound by EU rules[3]—there were four years of intense debate over what the new migration policy should be and what would replace free movement (Portes, 2016, 2018, 2019, 2021, 2022a, 2022b). During this period, EU citizens faced significant uncertainty regarding future migration policies and their rights to reside and work in the UK. On the one hand, this uncertainty may have discouraged potential new EU migrants—especially low-skilled workers—from choosing the UK as a destination, prompting them to prefer alternative destinations due to the difficulty of planning for themselves and their families (Di Iasio & Wahba, 2023). On the other hand, the same uncertainty may have encouraged some EU citizens to migrate to the UK before any policy changes took effect (Auer & Tetlow, 2023). Therefore, the overall impact of the Brexit referendum on migration flows is theoretically ambiguous and must be assessed empirically.

In January 2021, free movement for EU citizens came to an end, and the UK government introduced an employer-driven points-based work permit system that applies equally to EU and non-EU migrants. Under this system, work visas are granted only to medium- and high-skilled workers deemed able to fill shortages in the UK labour market, with applicants assessed on the basis of their skills. Low-skilled workers are generally ineligible for work visas, except through a seasonal agricultural workers programme. Even among higher-skilled occupations, restrictions apply when employers do not sponsor the application.

[2] See the following: https://www.electoralcommission.org.uk/who-we-are-and-what-we-do/elections-and-referendums/past-elections-and-referendums/eu-referendum/results-and-turnout-eu-referendum.

[3] Worker migration between the UK and other EU countries was not restricted until the entry into force of the points-based immigration system in January 2021 following Brexit.

Although it is still too early to evaluate the long-term effects of this new immigration regime, an important question concerns the impact of the referendum outcome on the migration behaviour of EU citizens before January 1st, 2021, when the UK formally exited the EU framework.

It should also be noted that many EU citizens living in the UK may not have registered with local population authorities, potentially leading to an undercount of the true number of migrants residing in the country (Rampazzo et al. 2021). Yet, at the end of the transition period (January 1st, 2021), eligibility for the new immigration system required migrants to hold settled or pre-settled status to remain in the UK after Brexit. As the direction of post-Brexit migration policy—especially its restrictions on low-skilled workers—became increasingly clear, many previously unregistered migrants may have rushed to formalise their residence status to avoid adverse consequences. This consideration applies equally to Italian emigrants who had been living permanently in the UK before Brexit.

Previous studies

Since the announcement of the Brexit referendum in 2015, the implications of a potential UK withdrawal from the EU have become a critical topic for scholars not only in economics and political science but also in sociology and demography (Breinlich et al., 2016; Tilford, 2015). Migration, in particular, has been widely debated by researchers (e.g., Barrett et al., 2015) and by political actors who amplified anti-immigration rhetoric in the public discourse (Cap, 2017). A widespread perception of uncontrolled migration played a significant role in shaping public opinion during the referendum campaign and strongly influenced the final outcome (Botterill et al., 2019; Evans & Mellon, 2019; Ford & Goodwin, 2017).

Since the referendum result, a vast literature has examined the consequences of Brexit for the UK (e.g., Treasury, 2018). Brexit has been argued to reshape public opinion, political behaviour, and party competition, and to contribute to long-term social change (Ford & Goodwin, 2017). Many studies have focused on economic implications (Armour, 2017; Graziano et al., 2021; McGrattan & Waddle, 2020), including the effects on trade (e.g., Berthou et al., 2020; Gutiérrez et al. 2021), while others have analysed the likely impact of the new migration regime (Benson et al., 2022a; Berthou et al., 2020; Campos & Timini, 2019). One of the central issues in the debate concerned the range of feasible Brexit scenarios—from a "hard" Brexit to a "soft" one (Currie, 2016; Wallace, 2016). The degree of restrictiveness of the post-Brexit migration framework ultimately depended on how the UK chose to implement Brexit and on the content of future trade and financial agreements with the EU. This context generated substantial economic and political uncertainty, affecting both EU migrants already living in the UK and potential future migrants, as well as the future governance of migration flows between the UK and the EU (D'Angelo & Kofman, 2017).

Uncertainty is a well-known determinant of migration decisions at the individual level (O'Connell 1997; Williams & Baláž, 2012), but it also shapes migration at the macro level (Donadelli et al., 2018; Moretto & Vergalli, 2012). This relationship has been investigated from multiple perspectives, as reviewed by Hall et al. (2022). Uncertainty is regarded both as a defining feature of migration trends and as a major challenge for future mobility (Barker & Bijak, 2021). Fraser and Üngör (2019) showed that migration is closely

linked to economic uncertainty, while Donadelli et al. (2018) emphasised the importance of personal risks and uncertainties.

Some scholars predicted a decline in migration flows following the end of free movement (Campos & Timini, 2019; Forte & Portes, 2017a, 2017b; Vargas-Silva, 2016), whereas others analysed migration dynamics after the referendum (Portes, 2021). Using regression-based approaches, several studies forecast a significant negative impact of Brexit on trade and migration flows between the EU and the UK, as well as broader macroeconomic effects through these channels (Berthou et al., 2020; Campos & Timini, 2019; Portes, 2022a). Di Iasio and Wahba (2023) examined the impact of the 2016 referendum and the expected Brexit on migration flows and net immigration to the UK over 2016–2019, employing a difference-in-differences strategy comparing EU and non-EU migration before and after the vote.

A large body of work has also explored the impact of Brexit on specific migrant communities in the UK (Benson et al., 2022a). After the referendum, many migrants reassessed their sense of belonging (Botterill et al., 2019). Most studies have focused on either the UK alone or on bilateral UK–EU/EEA or UK–non-EU/EEA relationships (Benson et al., 2022a). Other contributions have analysed how migrants already residing in the UK adjusted their plans (Jancewicz et al., 2020). Research has also examined British nationals living elsewhere in the EU, documenting their concerns and their efforts to secure their rights in the aftermath of Brexit (Auer & Tetlow, 2023; Benson et al., 2022b; Hall et al., 2022). Using Eurostat aggregate annual immigration data by nationality for 2008–2019, Auer and Tetlow (2023) show that the Brexit referendum led to a disproportionate increase in immigration of British nationals to other EU countries compared to movements of non-British EU/EFTA nationals to EU countries over the same period.

Hypotheses

Based on the existing literature, we hypothesize that the instability generated by the absence of a clearly defined migration policy during the 2016–2019 period may have redirected EU citizens' migration flows from Italy toward alternative destinations (*migration diversion hypothesis, H1*). Following Di Iasio and Wahba (2023), we apply a difference-in-differences approach to test these hypotheses, classifying all EU citizens migrating from Italy as the treatment group, while non-EU citizens constitute the control group (see Sect. "Data and methodology").

Unlike previous studies, however, we do not treat all EU citizens as a homogeneous group. Emigration behaviour varies considerably across different categories of EU citizens. First, we distinguish between Italian citizens and other EU nationals living in Italy who emigrate during the observation period. The latter have already migrated once and are generally more likely to migrate again than Italians (Benassi et al., 2019; Migali & Scipioni, 2018; OECD, 2008). Consequently, the political uncertainty triggered by the Brexit referendum may have influenced their migration decisions differently. Moreover, some EU nationals in Italy may simply return to their country of origin due to the natural completion of their migration project or for other reasons. Therefore, we hypothesise that Italian citizens were more affected by Brexit-related uncertainty and therefore redirected their destination choices to a greater extent than other EU citizens (*H2*).

Furthermore, among Italians, we distinguish between "Italians by birth" ("natives") and those who acquired Italian citizenship. The emigration behaviour of "naturalised

citizens" may differ depending on whether they were born abroad or in Italy. Those born abroad may find relocation easier due to their prior migration experience (Istat, 2022; Strozza et al., 2021), and their socioeconomic characteristics often resemble those of low-educated natives. By contrast, naturalised individuals born in Italy may behave more similarly to Italian natives. Overall, we expect naturalised natives to be less affected by uncertainty over future migration policies (*H3*). Finally, for Italians by birth—those for whom we have reliable information on education—we distinguish between low-, medium-, and highly educated migrants (i.e., those with primary, secondary, and tertiary education, respectively). As noted earlier, the UK's immigration system has been structured to favour the entry of high-skilled over low-skilled workers. Under conditions of uncertainty, this may have led low-skilled individuals to adjust their migration plans differently from high-skilled ones. High-skilled individuals may have perceived themselves as likely to remain welcome in the UK even after Brexit, much like highly skilled migrants from non-EU countries. Therefore, we hypothesise that the impact of Brexit-related uncertainty on the choice to migrate to destinations other than the UK (i.e., migration diversion) was stronger for low-skilled than for high-skilled workers (*H4*).

By empirically testing these hypotheses, we aim to contribute to a deeper understanding of the consequences of Brexit on migration flows from a country-of-origin perspective.

Italian emigration: some stylized facts

Italy has a long history of emigration and a comparatively recent experience of immigration. Like other Southern European countries, Italy underwent a renewed phase of emigration after the Second World War, accompanied by limited foreign immigration (King, 2000; Peixoto et al., 2012). The establishment of the European Economic Community (EEC) in 1957 stimulated intra-European mobility. Between 1946 and 1975, statistical sources estimate that around 5 million Italians emigrated to other European countries, resulting in a net migration loss of approximately 1.5 million people (King, 1985). The energy crisis of the 1970s and the subsequent anti-immigration policies adopted by host countries sharply reduced emigration flows and triggered a period of return migration (Bonifazi et al., 2009).

During this time, Italy also gradually became a country of immigration. Thanks to sustained inflows of immigrants—initially from North Africa, then from the Balkans, and more recently from the Middle East—the migration balance with foreign countries has been positive since 1973. Nevertheless, the emigration of Italian citizens has continued, giving rise to a new form of mobility.

Another major turning point was the creation of the European Union under the Maastricht Treaty in 1993. Free movement rights significantly reshaped mobility within Europe, enabling millions of EU citizens to relocate and reside across member states. The UK played a central role in this process, becoming one of the main destinations for EU migrants. Italy is among the leading countries of origin in these flows and, since 2015, the UK has become the primary destination for emigration from Italy (Istat, 2017).

According to official statistics, more than 809,000 Italians emigrated during the period 2012–2019, with a clear upward trend: around 68,000 departures in 2012 compared to more than 122,000 in 2019 (+79%) (Table 1). What characterises this new emigration wave, however, is not so much the scale—substantially lower than in the past—but

Table 1 Emigrations from Italy in the years from 2012 to 2019.
Source: Our elaborations on ISTAT data

Years	Total Emigrations	Italians	Of which: Italians Naturalized	% of Naturalized on Emigrations
2012	106.216	67.998	3.314	3,1
2013	125.735	82.095	5.540	4,4
2014	136.328	88.859	8.457	6,2
2015	146.955	102.259	13.696	9,3
2016	157.065	114.512	19.837	12,6
2017	155.110	114.559	23.336	15,0
2018	156.960	116.732	27.274	17,4
2019	179.505	122.020	26.326	14,7

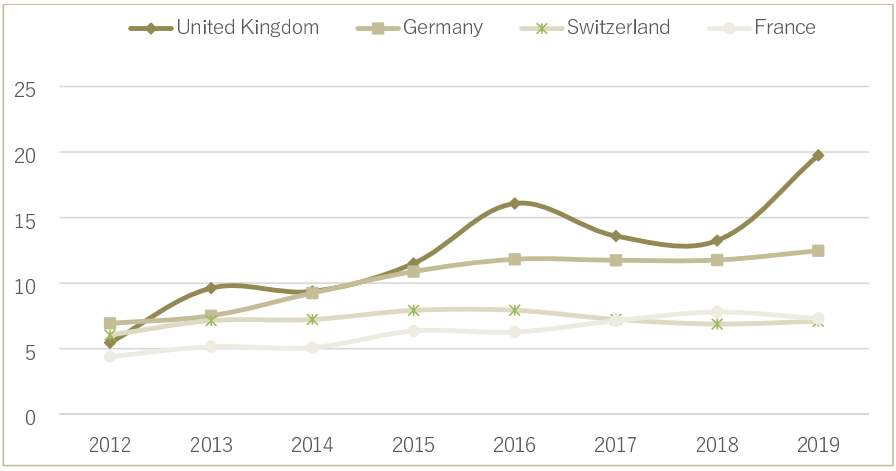


Fig. 1 Italian emigrants (aged 25–64) to main EU countries of destination (thousand). Years: 2012–2019.
Source: Our elaborations on ISTAT data

rather the changing profile of those who leave. The heterogeneity of contemporary Italian emigrants can be observed in terms of skills (high-skilled versus low-skilled) and citizenship status (Italian at birth versus foreigners and naturalised citizens). The outflows increasingly include "new Italians", i.e. foreign residents who acquired Italian citizenship before emigrating.[4] Their rising share reflects the deeply different migration behaviours of Italians at birth and naturalised individuals, particularly regarding their propensity to move (Bonifazi et al., 2021).

Work, housing, and family-related reasons are the most common drivers of mobility across all age groups. Most moves occur during working age — a period of life-course transitions such as labour market entry, higher education, marriage, or parenthood. Individuals aged 25–64 account for most emigrants (around 68%) and exhibit the highest migration rates. Italian emigrants in this age group predominantly move to European countries, with one in three choosing the UK or Germany as their preferred destination (Fig. 1).

The flows of adult Italian citizens moving to the UK have grown steadily, contributing to the already substantial stock of Italians residing in England and Wales (around 439,000 in January 2022 according to AIRE data). This stock has doubled over the past decade and increased by 40% compared to 2016, the year of the Brexit referendum.

[4] The acquisition of citizenship by foreign residents grew from 65 thousand in 2012 to 127 thousand in 2019. As of 1 January 2020, around 1517 thousand foreigners had acquired Italian citizenship.

In the early 2000s, the Italian presence in the UK was mostly composed of well-educated middle-class young adults (Conti, 2012). Over the following decade, however, the profile of migrants changed. The traditionally high-skilled component was increasingly accompanied by flows of young, less-skilled workers, often excluded from stable opportunities in the Italian labour market (D'Onofrio and Marino 2017). During our sample period, migration outflows were characterised by a larger share of individuals with an educational level equal to or lower than upper secondary education (Fig. 2). A key determinant of these outflows has been the strong UK demand for foreign labour in sectors marked by high turnover, low qualification requirements, low wages, and flexible working arrangements (the so-called "social dumping"). Since the mid-2000s, this demand has been met increasingly through intra-EU migration rather than extra-EU inflows. Employer preferences for specific nationalities deemed suitable for certain roles also played a role (MacKenzie & Forde, 2009). These dynamics help explain the migration of low-educated Italians into sectors such as catering, as well as the mobility of medium- and high-educated youth.

Finally, it is worth noting that the migration propensity of Italians at birth to the UK, disaggregated by education level, exhibits more variability over time than the propensity to migrate to other EU countries, which follows an almost linear growth pattern (Figs. 3 and 4). This distinct trend may be associated with the uncertainty created by Brexit, an issue analysed in the next section. In both cases, the emigration propensity of highly skilled individuals is, on average, twice as high as that of low- and medium-skilled individuals.

Data and methodology

To evaluate the effect of the Brexit referendum on migratory flows from Italy, we adopt a difference-in-differences (DD) strategy. In the first stage of the analysis, all EU citizens migrating from Italy to foreign countries (excluding the UK) constitute the treatment group, while all non-EU citizens emigrating to the same destinations serve as the control group.

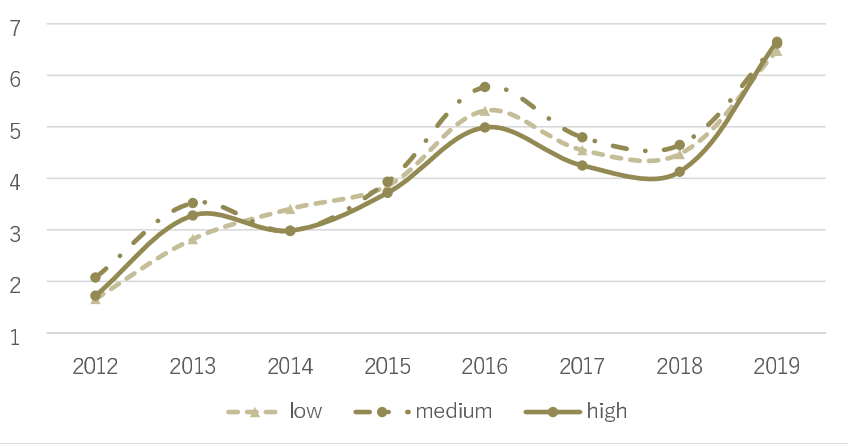


Fig. 2 Emigration flows of Italians at birth (aged 25–64) to the UK by education level (thousands). Years: 2012–2019. Source: Our elaborations on ISTAT data

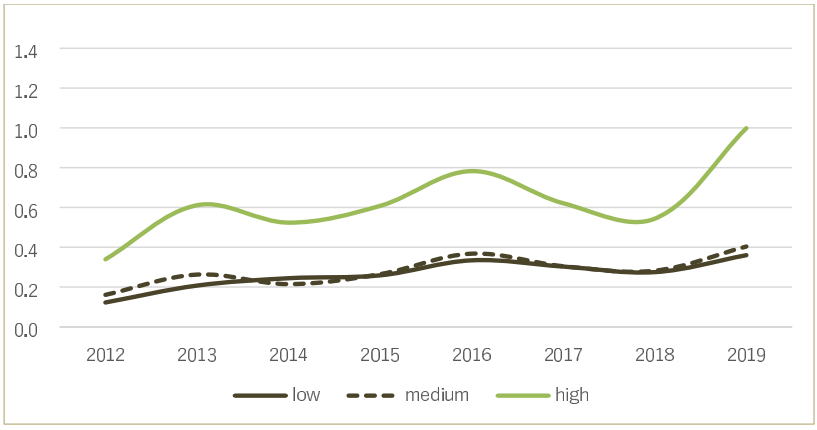


Fig. 3 Emigration rates of Italians at birth (age 25–64) to the UK by level of education (per thousand of habitants). Years: 2012–2019.
Source: Our elaborations on ISTAT data

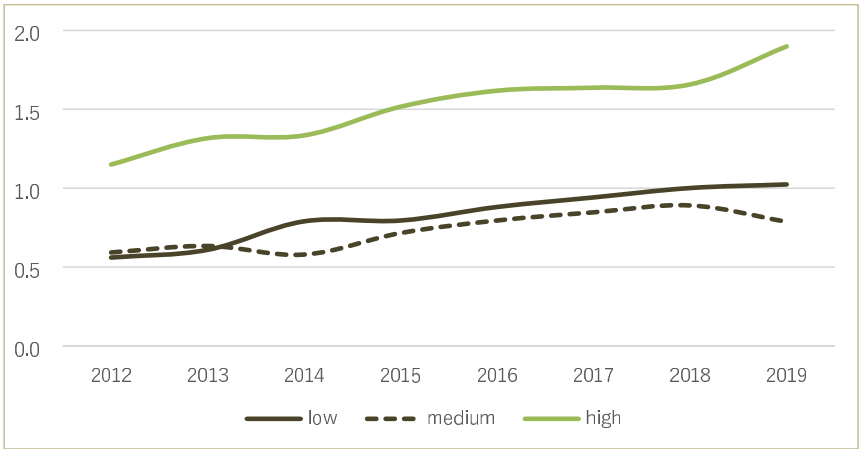


Fig. 4 Emigration rates of Italians at birth (age 25–64) to other countries (except the UK) by education level (per thousand of habitants). Years: 2012–2019.
Source: Our elaborations on ISTAT data

The analysis relies on data on changes of residence recorded in the Municipal Population Registers.[5] The Italian National Institute of Statistics (ISTAT) collects these data at the municipal level. The microdata include individual information on age, educational attainment, and citizenship, as well as origin and destination country. Crucially, they allow us to distinguish between Italians at birth and Italians who have acquired citizenship. These data also ensure consistency between migration flows and the resident population by citizenship.

The observation period covers the years 2012–2019. We exclude 2020—although it is the year of the UK's actual exit from the EU—because mobility-restriction measures adopted globally in response to the COVID-19 pandemic affected countries unevenly (e.g., due to different border control measures). A counterfactual approach would not

[5] Official data on change of residence may suffer from some limitations due to the administrative data registration process, which may not accurately capture de facto migration changes. Registration or de-registration from the population registers due to migration is a formal act that may take place after an actual move to/from a foreign country and may underestimate the outflow of foreigners who leave the country without reporting their departure. Generally, this statistical bias is not relevant and is homogeneously distributed across citizens and destinations.

fully account for these heterogeneous shocks. During our sample period, no major changes occurred in UK immigration policy toward EU or non-EU citizens.

We compute outward migration flows of individuals aged 25–64 of nationality i (per thousand inhabitants) moving from Italy to destination area d[6] in year t. For Italian citizens, emigration rates are computed using the resident Italian population aged 25–64 as the population at risk; for foreign citizens, the denominator is the foreign resident population in the same age group. The country of origin is always Italy.

We consider 19 nationality groups[7] (excluding British emigrants). Italian citizens are split into Italians at birth and naturalised Italians; the latter are further divided into those born in Italy and those born abroad, while Italians at birth are classified by educational attainment (low, medium, and high). Each foreign nationality group is additionally separated into (i) those returning to their country of origin and (ii) those moving to another foreign destination. As a result, for each year t, we observe 304 dyadic observations (i–d pairs), representing migration flows from 19 citizenship groups to 16 destination areas.

We now illustrate the empirical strategy used to identify the causal impact of Brexit on migration diversion. As noted above, the outcome variable is the emigration rate (per thousand inhabitants) of Italian and foreign citizens from Italy to destinations other than the UK. A simple before-and-after comparison of EU emigrants (the treated group) would not yield causal conclusions, as time-varying confounders may also influence migration. The DD approach addresses this by comparing before-and-after changes in outcomes between the treatment and control groups. The causal effect of the referendum is thus given by the difference in the post-treatment outcome gap between groups minus the difference in the pre-treatment outcome gap. This removes common time-varying factors.

The validity of the DD design depends on the parallel-trend assumption—that the treated and control groups would have followed similar trends in the absence of the treatment (Angrist & Pischke, 2008). This assumption can be assessed by examining pre-treatment outcome trends for both groups. Parallel pre-treatment dynamics suggest that the groups would likely have continued to evolve similarly in the absence of treatment.

In a multi-period setting, the DD estimator is implemented via a two-way fixed-effects (TWFE) model:

$$y_{idt} = \alpha_{id} + \gamma_t + \tau D_{it} + \sum_{k=}^{K} x_{k,dt}\beta_k + \varepsilon_{idt} \tag{1}$$

where y_{idt} is the outcome, i indexes nationality, d destination area, and t year (excluding 2016). The treatment dummy (D_{it}) equals 1 for EU nationality (Italians at birth, naturalized Italians, and other EU citizens) in post-referendum years ($t > 2016$). Its coefficient (τ) captures the average treatment effect on the treated (ATT; Goodman-Bacon, 2018). The vector $\sum_k x_{k,dt}$ includes destination-specific covariates: log GDP per capita, unemployment rate, and log of life expectancy at birth. The terms α_{id} are nationality-by-destination fixed effects; γ_t are year fixed effects, and ε_{idt} an idiosyncratic error assumed to be identically and independently distributed.

To test the parallel-trend assumption, we also estimate an event-study version of Eq. (1):

[6] See Table 4 in Appendix.

[7] See Table 5 in Appendix.

$$y_{idt} = \alpha_{id} + \gamma_t + \sum_{e=-L}^{-1} \delta_e D_{it}^e + \sum_{e=0}^{M} \theta_e D_{it}^e + \sum_{k=1}^{K} x_{k,dt}\beta_k + \upsilon_{idt} \quad (2)$$

where $e = 0$ denotes the treatment year. As in standard event, leads (M) are binary variables representing periods *after* the event, used to estimate the effect of the event on outcomes in the periods following it; lags (L) are binary variables representing periods *before* the event, used to estimate the effect of the event in the periods leading up to it, often used to check for pre-trends. The event itself is normalized to time zero, and the leads and lags capture the estimated effects relative to this baseline period. For example, a "+1 lead" indicates the first period after the event and a "−1 lag" indicates the first period before the event. The effects of a series of lags and leads can indicate if there was an anticipatory effect or a persistent long-term effect. Therefore, δ_e are the pre-event coefficients, which can also be used as a diagnostic tool to assess the parallel trend assumption, while the θ_e coefficients measure the effect of participating in the treatment at different lengths of exposure to the treatment. We provide a Wald test for the null hypothesis of a joint lack of significance of the δ_e coefficients.

So far, we have assumed that all EU citizens form a homogeneous treatment group. As discussed in Sect. "Background and research questions", we relax this assumption and allow migration responses to differ across groups. Accordingly, we estimate Eqs. (1) and (2) within three separate specifications. Model 1 treats all EU citizens migrating from Italy to countries other than the UK as the treated group. Model 2 distinguishes between Italians and other EU citizens. Model 3 focuses exclusively on Italians and further disaggregates the treated group into naturalised citizens (born in Italy or abroad) and Italians at birth differentiated by education (low, medium, and high). All heterogeneous treatment effects are estimated relative to the control group, which is the omitted category.

Estimation results

Main evidence

This section presents the results of the counterfactual analysis evaluating the impact of the 2016 Brexit Referendum on migration (Tables 2 and 3). The outcome variable is the emigration rate (from Italy to other countries, excluding the UK). As explained above, we consider 304 potential citizenship–destination (id) combinations over seven years. However, emigration flows are zero for some id–year pairs, which we exclude from the analysis. As a result, the panel is unbalanced: the number of cross-sectional units (id) is 208, the number of years per unit ranges from 2 to 7, and the total number of observations

Table 2 TWFE estimates Treatment groups: EU citizens, Italians, and Other EU citizens

	Model 1	Model 2	
	EU citizens	**Italians**	**Other UE citizens**
τ	0.014*	0.015*	0.012
	(0.008)	(0.008)	(0.012)
Wald test (Chisq)	2.316	2.528	1.290
	[0.509]	[0.470]	[0.732]

Outcome variable: the out-migration rate (from Italy to groups of countries, as defined in Sect. "Data and methodology"). The coefficient indicates the ATT parameter which is the migration diversion effect of the Brexit Referendum (τ). Standard errors are in parenthesis. *, **, and *** denote significance at the 10, 5, and 1 percent levels, respectively. Inference is based on robust (against heteroskedasticity across groups) covariance matrix estimators according to the White method for panel models (Arellano, 1987). Observations are also clustered by "group" (i.e. by dyadic combinations *id*) to account for within-group serial correlation. The Wald test is the test of parallel trend assumption (joint significance of the ATT coefficient for the years before the treatment) (see Eq. 2). The *P*-value is in square brackets. Unbalanced panel: No. of cross-sectional units = 208; No. of years per cross-sectional units = 2–7; Total no. of observations = 1,413

Table 3 TWFE estimates Treatment groups: Naturalized Italians and Natives by Education Level

	Model 3				
	Naturalized born abroad	**Naturalized born in Italy**	**Natives**		
			High	**Medium**	**Low**
τ	0.019**	0.003	0.020	0.011	0.024**
	(0.009)	(0.007)	(0.014)	(0.010)	(0.011)
Wald test (Chisq)	0.500	0.082	5.900	0.976	3.798
	[0.919]	[0.994]	[0.117]	[0.807]	[0.284]

See Table 2. Unbalanced panel: No. of cross-sectional units = 168; No. of years per cross-sectional units = 2–7; Total no. of observations = 1135

is 1413. Sect. "Robustness checks" reports a robustness check based on pseudo-Poisson regression methods applied to a balanced panel that includes zero flows.

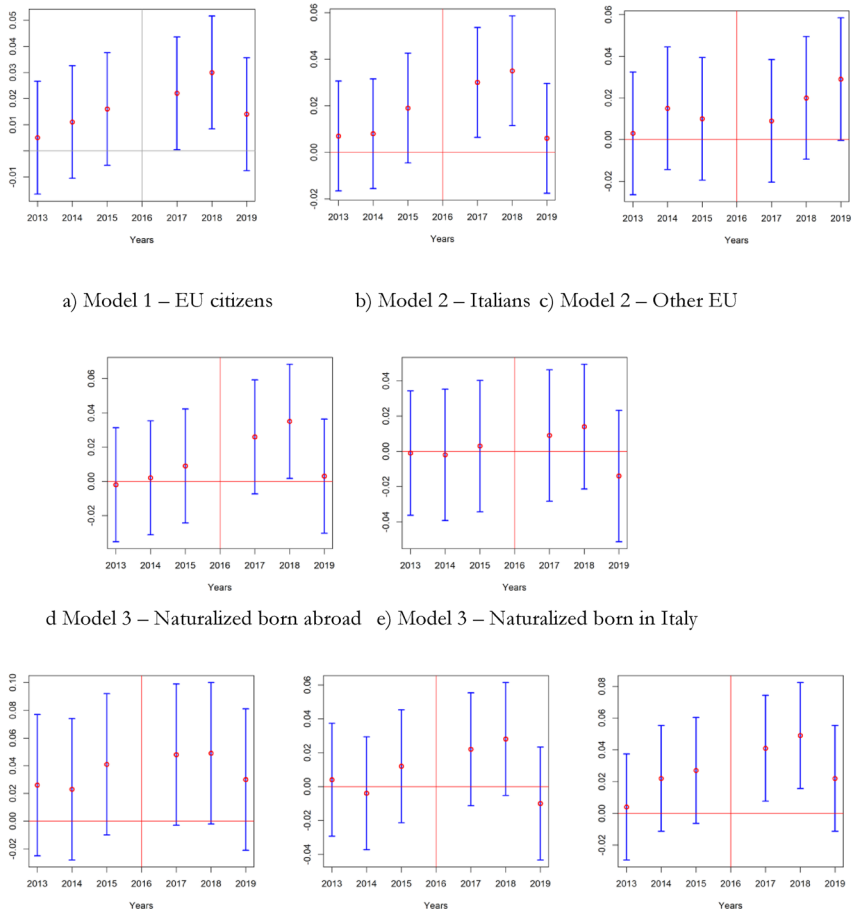
We begin by estimating Eq. (1), using as the treatment group all EU citizens migrating from Italy to foreign countries other than the UK (Table 2 column "**Model 1**"). For this group, the TWFE regression results support the hypothesis that policy uncertainty triggered by Brexit generated migration diversion. The coefficient of the difference-in-differences estimator, τ, associated with the dummy D_{it}, is positive and statistically significant. Inference is based on covariance-matrix estimators robust to heteroskedasticity across groups, following the White method for panel models (Arellano, 1987). Observations are also clustered by (*id*) "group" to account for within-group serial correlation.

The coefficient should be interpreted as a change in the emigration rate: for instance, a value of 0.014 implies that, due to the EU Referendum, the emigration rate of EU citizens from Italy to non-UK destinations increased by 0.014 relative to the emigration rate of non-EU citizens. In other words, periods of uncertainty in migration policy following the Brexit vote encouraged potential migrants from Italy to relocate to alternative destinations. This finding contrasts with Di Iasio and Wahba (2023), who do not detect spillover effects or changes in the relative attractiveness of other EU destinations. Their result—based on the OECD International Immigration Database—captures an average effect across OECD countries, potentially masking cross-country heterogeneity. Moreover, their dependent variable is the log of gross migration flows, whereas ours is the emigration rate.

We conduct a placebo test using pre-treatment years to assess the validity of our identification strategy (Eq. 2). The Wald test for the joint significance of the ATT coefficients in the pre-treatment period (Table 2) supports the parallel-trend assumption; Fig. 5a corroborates this result.

A key contribution of our analysis, and one that justifies the use of a single-source-country migration dataset, is the assessment of whether citizenship heterogeneity matters for the impact of Brexit on migration behaviour. The estimation of **Model 2** (Table 2) confirms this hypothesis. When we distinguish EU citizens into two treatment groups—Italian citizens and Other-EU citizens—only the former exhibit a significant migration-diversion response to the Referendum shock. The coefficient τ associated with the dummy D_{it}(ATT)[8] for Italians indicates an increase of 0.015 in the emigration rate of Italians relative to non-EU citizens after the Referendum. It is significant at

[8] In Models 2–5, heterogeneous effects are estimated by replacing the single treatment dummy D_{it} with multiple mutually exclusive indicators, each corresponding to one specific subgroup (e.g. Italians at birth, naturalised Italians born abroad, etc.). This approach allows us to estimate all group-specific effects within the same specification, ensuring comparability across groups and avoiding potential inconsistencies that may arise from estimating separate regressions on different sub-samples.



a) Model 1 – EU citizens b) Model 2 – Italians c) Model 2 – Other EU

d Model 3 – Naturalized born abroad e) Model 3 – Naturalized born in Italy

f) Model 3 – Italian Natives-High g) Model 3 – Italian Natives-Medium h) Model 3 – Italian Natives-Low

Fig. 5 Parallel trends of the outflows from Italy. Note: Coefficient estimates are shown with 95% confidence intervals

the 10% level. By contrast, the ATT coefficient for Other-EU citizens is positive but not statistically significant. The parallel-trend assumption is satisfied for Model 2 as well (Fig. 5b and c).

The absence of significant effects for Other-EU citizens may reflect the prevalence of return migration among this group. A substantial share (55.4%) consists of Romanians returning from Italy to Romania. This is consistent with evidence showing that these migrants are more likely to accumulate social remittances (knowledge, skills) and economic remittances which can be reinvested in their origin country (Anghel et al., 2017). Similar patterns apply to Bulgarians, Poles, and other Eastern European citizens. Sect. "Robustness checks" revisits this interpretation with robustness checks excluding return-migration flows from the dataset.

We now focus on the effect of Brexit on the outflows of Italian citizens. Table 3 reports TWFE estimates excluding the migration flows of Other-EU citizens and dividing Italians into two sub-groups: naturalized citizens and Italians by birth, the latter further disaggregated by education level (Model 3; Table 3). The parallel-trend assumption holds for all five treated groups (Fig. 5d–h).

Interestingly, no significant diversion effect emerges for naturalized individuals born in Italy and for native Italians with high or medium education. By contrast, low-educated

native Italians and naturalized born abroad are significantly affected by the Brexit shock, redirecting their migration towards non-UK destinations.

The coefficient for low-educated Italians (0.024) is statistically significant at the 5% level. This indicates that their emigration rate to non-UK countries increased by 0.024 relative to the counterfactual scenario without the Brexit shock. A similar diversion effect is found among naturalized individuals born abroad, whose socioeconomic characteristics may resemble those of low-educated natives. Their corresponding coefficient (0.019) is also significant at the 5% level. This suggests that more precarious labour-market positions may have heightened their sensitivity to post-Brexit uncertainty, encouraging a reorientation toward other European destinations.

In contrast, no significant diversion effect emerges for highly skilled migrants or naturalized individuals born in Italy. The former may still feel welcomed in the UK after Brexit, much as highly skilled non-EU workers have traditionally been able to migrate there. The latter—whose processes of integration and socialization in Italy resemble those of native Italians—appear less affected by perceived risks associated with Brexit.

Robustness checks

The results discussed above are based on TWFE estimates of a model that examines migration flows from Italy by individuals belonging to 19 distinct citizenship groups toward 16 destination groups (excluding the UK). The findings indicate that the uncertainty triggered by Brexit significantly influenced migration diversion only among native Italian citizens with low levels of education. Nevertheless, these results may be affected by two potential sources of bias.

First, as previously noted, some migration flows involving foreign citizens can be classified as return migration—a distinction enabled by the unique characteristics of our dataset. It is reasonable to assume that return migration is shaped by factors substantially different from those governing labour migration, and therefore is less likely to be influenced by the Referendum outcome. Second, the estimates presented thus far rely on an unbalanced panel, since all dyadic observations (citizenship–destination combinations) with zero migration flows were excluded. Such exclusion may introduce selection bias, insofar as a zero flow may represent a deliberate and meaningful decision by a given citizenship group not to migrate to a specific destination.

This section reports robustness checks designed to assess the relevance of these two potential sources of bias. Tables 6 and 7 in the Appendix present TWFE estimates for the same three models shown in Tables 2 and 3 of the main text, using the migration rate as the dependent variable but excluding all flows classified as return migration. Overall, the results are qualitatively consistent with those in Tables 2 and 3: the only treated group significantly affected by Brexit in terms of migration diversion remains the group of low-educated Italian citizens, and the parallel-trend assumption is always satisfied. The main difference is that the treatment-effect coefficients reported in the Appendix are smaller in magnitude but estimated with greater precision (i.e., they exhibit lower standard errors).

Finally, to evaluate the impact of excluding zero migration flows, we applied the pseudo-Poisson maximum likelihood estimator (Santos Silva & Tenreyro, 2006) to a balanced dataset including 715 zero dyadic flows out of 2128 possible flows (33%, obtained by multiplying the 304 dyadic flows by 7 years). The model includes fixed effects for

each citizenship group, each destination group, and each year. The log of population size is included on the right-hand side as an offset term (i.e., a structural predictor with a fixed coefficient equal to 1). Standard errors are corrected for intra-cluster serial correlation using a three-way clustered variance–covariance estimator. The results reported in Appendix Table 5 are qualitatively in line with those obtained using the unbalanced panel However, these pseudo-Poisson estimates should be interpreted with caution, as we encountered substantial difficulty in satisfying the parallel trend assumption —likely due to the high dispersion introduced by the large number of zero flows.

The limitations of our analysis stem from the nature of the data source, which—although providing detailed information on migrants—retains the typical constraints of administrative data. In particular, migration events are recorded only when they are reported to population registers, rather than at the time they actually occur. Despite this delay, we are confident that our findings remain robust, as this reporting bias is consistent across all migration events, regardless of migrants' nationality or destination.

Looking ahead, future research will examine the impact of post-Brexit policies on migration flows from Italy. Recent empirical evidence indicates a contraction of flows to the UK and the emergence of new destinations at the top of the ranking of receiving countries (Istat, 2025). However, the effects of the UK's new migration policy may be intertwined with those of the global pandemic during 2020–2022, which introduced additional uncertainties—particularly in the health sector—affecting both emigration and return migration.

Understanding the drivers of migration flows, the rise of new destination countries, and the influence of global uncertainties remains a key challenge for interpreting ongoing changes. Future research contributions can help build a more comprehensive picture of the motivations and consequences underlying these patterns, thereby providing useful insights for a more informed understanding of the phenomenon and for the development of more effective and better-targeted policies.

Conclusions

Has the Brexit referendum outcome altered the relative attractiveness of the UK compared with other foreign destinations for EU migrants? This study offers several key insights by adopting the perspective of a single country of origin—Italy—and provides evidence in support of the migration diversion hypothesis (H1). In other words, the policy uncertainty triggered by Brexit led EU citizens residing in Italy to behave differently from non-EU citizens, more frequently choosing destinations other than the UK. This result contrasts with the findings of Di Iasio and Wahba (2023), who report no evidence of migration diversion when considering OECD countries as a whole. Their result suggests that substantial cross-country heterogeneity may be masked by average effects.

Moreover, our findings highlight the value of using microdata and a longitudinal framework to examine specific subpopulations of interest, such as Italian-born individuals (by educational attainment), naturalized Italians, and other EU citizens, excluding British nationals. While the first version of the model reveals a clear migration diversion effect among all EU citizens emigrating from Italy—the overall treatment group—the multi-treatment specification shows that this effect is amplified for Italian citizens and not significant for other EU citizens, in line with hypothesis H2. When we further disaggregate the treated Italian group into naturalized citizens (born abroad or in Italy)

Table 4 Aggregation of Destination Countries

Group	Destination Area Description
1	Belgium, Netherlands, Luxembourg
2	Denmark, Finland, Sweden
3	Spain, Portugal
4	Malta, Greece, Cyprus
5	Bulgaria, Romania
6	Germany, Austria
7	France
8	Ireland
9	Poland, Hungary, Estonia, Latvia, Lithuania, Croatia, Slovenia, Slovakia, Czech Republic
10	Africa
11	Asia
12	Brazil, Venezuela, Argentina
13	Other Central and South American countries
14	EFTA countries (Iceland, Liechtenstein, Switzerland, Norway)
15	Other non-EU European countries
16	USA, Canada, Oceania

and Italian-born individuals with different levels of educational attainment, we find that naturalized individuals born abroad and low-skilled Italian-born emigrants are those significantly affected by Brexit in terms of migration diversion. This result is consistent with the UK's post-Brexit policy orientation, which places clear distinctions between high-skilled and low-skilled migrants.

Our results reinforce the connection between migration dynamics and uncertainty. Uncertainty appears to be particularly influential for specific groups that are generally less likely to migrate. Although Brexit represents a unique event within the broader context of free mobility in the EU, our findings confirm that political uncertainty can shape migration flows as well as individuals' potential migration decisions.

Table 5 Aggregation of Citizenship Groups

Group	Citizenship Group Description
1	Low-skill native Italians
2	Medium-skill native Italians
3	High-skill native Italians
4	Naturalized Italians (born in Italy)
5	Naturalized Italians (born abroad)
6	Western EU citizens **not** returning to their origin countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Luxembourg, Netherlands, Portugal, Spain, Sweden)
7	Western EU citizens **returning** to their origin countries (same countries as above)
8	Eastern EU citizens **not** returning to their origin countries (Bulgaria, Croatia, Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Romania, Slovakia, Slovenia, plus Cyprus and Malta)
9	Eastern EU citizens **returning** to their origin countries (same countries as above)
10	Other European (non-EU) citizens from EFTA and other non-EU European countries **returning** to their origin countries
11	Other European (non-EU) citizens from EFTA and other non-EU European countries **not** returning to their origin countries
12	Asian citizens **returning** to their origin countries
13	Asian citizens **not** returning to their origin countries
14	African citizens **returning** to their origin countries
15	African citizens **not** returning to their origin countries
16	North America & Oceania citizens **returning** to their origin countries
17	North America & Oceania citizens **not** returning to their origin countries
18	Central & South America citizens **returning** to their origin countries
19	Central & South America citizens **not** returning to their origin countries

Table 6 TWFE estimates, excluding return migrations Treatment groups: EU citizens, Italians, and Other EU citizens

	Model 1	**Model 2**	
	EU citizens	**Italians**	**Other UE citizens**
τ	0.007**	0.010**	0.001
	(0.003)	(0.004)	(0.005)
Wald test (Chisq)	2.836	5.312	0.349
	[0.418]	[0.150]	[0.951]

Outcome variable: the out-migration rate (from Italy to groups of countries, as defined in Sect. "Data and methodology"). The coefficient indicates the ATT parameter, which is the migration diversion effect of the Brexit Referendum (τ). Standard errors are in parentheses. *, **, and *** denote significance at the 10, 5, and 1 percent levels, respectively. Inference is based on robust (against heteroskedasticity across groups) covariance matrix estimators according to the White method for panel models (Arellano, 1987). Observations are also clustered by "group" to account for within-group serial correlation. The Wald test is the test of parallel trend assumption (joint significance of the ATT coefficient for the years before the treatment) (see Eq. 2). The *P*-value is in square brackets. Unbalanced panel: No. of cross-sectional units = 192; No. of years per cross-sectional units = 2–7; Total no. of observations = 1301

Table 7 TWFE estimates, excluding return migrations Treatment groups: Naturalized Italians and Natives by Education Level

	Model 3				
	Naturalized born abroad	**Naturalized born in Italy**	**Natives**		
			High	**Medium**	**Low**
τ	0.013**	-0.002	0.014	0.005	0.018**
	(0.006)	(0.002)	(0.011)	(0.006)	(0.009)
Wald test (Chisq)	0.368	0.153	4.752	1.587	2.884
	[0.947]	[0.984]	[0.123]	[0.662]	[0.487]

See Table 4. Unbalanced panel: No. of cross-sectional units = 160; No. of years per cross-sectional units = 2–7; Total no. of observations = 1079

Table 8 Pseudo-Poisson estimates Treatment groups: EU citizens, Italians, and Other EU citizens

	Model 1		**Model 2**		
	EU citizens		**Italians**		**Other EU citizens**
τ	0.232**		0.255**		0.067
	(0.095)		(0.111)		(0.091)
	Model 3				
	Naturalized born abroad	Naturalized born in Italy	Natives		
			High	Medium	Low
τ	1.123***	-0.142	0.133	0.095	0.231***
	(0.134)	(0.114)	(0.081)	(0.082)	(0.083)

Outcome variable: the out-migration flows (from Italy to groups of countries, as defined in Sect. "Data and methodology"). The estimates include the population as an offset term, and fixed effects for nationalities, destinations, and years. The coefficient indicates the ATT parameter, which is the migration diversion effect of the Brexit Referendum (τ). Standard errors are in parentheses. *, **, and *** denote significance at the 10, 5, and 1 percent levels, respectively. Observations are also clustered by "group" to account for within-group serial correlation. Balanced panel: total no. of observations = 2128

Appendix

See Tables 4, 5, 6, 7 and 8.

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Author contributions
FL prepared the dataset, interpreted the estimation results of double-difference analysis, and was a major contributor in writing the manuscript. RB conceptualized the double-difference model and was a major contributor in writing the manuscript. CR performed the literature review. ET performed the descriptive analysis. All authors read and approved the final manuscript.

Data availability
The datasets generated and analysed during the current study are not publicly available due to privacy issues but are available from the corresponding author on reasonable request.

Declarations

Competing interests
The authors declare that they have no competing interests.

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