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Seyhun Orcan Sakalli
University of Lausanne

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IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Mass Refugee Inflow and Long-Run Prosperity: Lessons from the Greek Population Resettlement*

This paper investigates the long-term consequences of mass refugee inflow on economic development by examining the effect of the first large-scale population resettlement in modern history. After the Greco-Turkish war of 1919–1922, 1.2 million Greek Orthodox were forcibly resettled from Turkey to Greece, increasing the Greek population by more than 20% within a few months. We build a novel geocoded dataset locating settlements of refugees across the universe of more than four thousand Greek municipalities that existed in Greece in 1920. Exploiting the spatial variation in the resettlement location, we find that localities with a greater share of refugees in 1923 have today higher earnings, higher levels of household wealth, greater educational attainment, as well as larger financial and manufacturing sectors. These results hold when comparing spatially contiguous municipalities with identical geographical features and are not driven by pre-settlement differences in initial level of development across localities. The long-run beneficial effects appear to arise from agglomeration economies generated by the large increase in the workforce, occupational specialization, as well as by new industrial know-hows brought by refugees, which fostered early industrialization and economic growth.

JEL Classification: O10, O43, N34, N44

Keywords: refugees, immigration, historical persistence, economic development

Corresponding author:
Elie Murard
IZA
Schaumburg-Lippe-Str. 5-9
53113 Bonn
Germany

E-mail: murard@iza.org

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1 Introduction

Displacement of people are common throughout history. The 20th century alone has witnessed the flight of 12 millions Ethnic German from Central Europe after World War II, the forced resettlement of 14m of Hindus and Muslims following the 1947 partition of India and the mass deportation of Balkan ethnic minorities during the 1990s Yugoslav wars, just to mention a few. Recently, international conflicts displaced millions of Syrian refugees, and many more are to be expected as environmental changes continue. Compulsory large-scale population transfers constitute a structural break in the social and economic history of modern nations. Despite this, little evidence exists on how forced population resettlement affects host countries in the long-run. We contribute to fill this gap by focusing on one of the first population resettlement in modern history which took place between Greece and Turkey in 1923. In the aftermath of the Greco-Turkish war of 1919–1922, roughly 1.2 million Christian-Orthodox were forcibly resettled from Turkey to Greece, increasing the Greek population by more than 20% within a few months. Exploiting this unique historical natural experiment, we examine the long-run consequences of the mass refugee inflow on economic development, industrialization and prosperity.

We built and geocoded an entirely novel dataset of refugee settlements, obtaining a full coverage of the universe of more than four thousand municipalities that existed in Greek in 1920. We digitalized the Greek historical censuses of 1920 and 1928 and combined the with post-1970 censuses. Producing these data is our first contribution. Our second contribution is to provide the first systematic quantitive exploration of the overall long-term impact of the Greco-Turkish population resettlement. Using a wide range of measures of contemporary prosperity, we study the comparative economic development across places of refugee resettlement and other localities that received few or no refugees.

Due to the limited resources of the Greek State, the League of Nations intervened and formed the Refugee Settlement Committee (RSC) in 1923 to undertake the relief and resettlement of Greek refugees. We exploit three unique features of this historical episode to characterize the selection into resettlement localities. First, refugees had to form groups (based on their origin community) to which the RSC assigned a place of resettlement. This institutionalized framework left very little scope for choice, on the part of the refugees, regarding the location of their initial settlement, at least in rural areas. Second, because the RSC's mandate was to establish the refugees into agricultural work (to make them self-

supporting), the RSC planners determined the settlements' location based on the availability of suitable land for cultivation, which was the key factor of the capacity for absorption of new population. Nevertheless, historical accounts indicate that many refugees, coming from Ottoman urban centers and were not used to agricultural labor, did not remain in their initial agricultural settlement and moved into the cities. Our data corroborates that refugees were disproportionality over-represented in cities where they accounted for 27% of the population relative to 12% in rural localities. To address this self-selection issue, we restrict our analysis to rural localities – where more than two third of the population were living at that time – and exclude the 59 cities that existed in Greece in 1928. The third feature of the rural resettlement was that it brought refugees who, on average, were less educated that Greek natives and were more likely to be farmers. Given the lower human capital of refugees and the fact that Greece was not yet industrialized in 1920 – farmers made up 80% of the employed population – the choice of the location of final settlement in an agrarian economy were unlikely correlated with expected returns from education and entrepreneurship, or by greater potential for economic growth more generally.

In the absence of an ideal randomized experiment, establishing the causal effects of such refugee inflow poses a host of empirical challenges. We begin by documenting that in 1920, before the population resettlement, rural provinces that were to receive refugees settlements in the next years were very similar to other areas in Greece. Conditional on geographical factors (topography, climate, and soil attributes), refugee settlement provinces had very similar initial levels of population density, literacy rate, and employment share of the non-agricultural sector relative to other provinces. We also document a very similar evolution in the natives' literacy rate across provinces with varying levels of refugee presence for cohorts born before 1920 (i.e., parallel pre-trends in education). We then implement a series of empirical methods that rely on different margins of spatial variation in the inflow of refugees conditional on geographical factors. Given the observed absence of selection at the province level, we first implement OLS regressions that only exploits variation in the refugee inflow at the same level, i.e., across 140 Greek provinces. Nonetheless, because settlements were mostly concentrated on specific regions of Greece (the North and Crete), province-level estimates rely on comparing areas that are geographically far apart and thus possibly exposed to heterogeneous confounding shocks. To address this concern, we take advantage of the very disaggregated data we compiled at the municipality level and exploit variation in refugee

inflow within provinces to estimate municipal-level regressions with province fixed effects. While within-province comparisons helps to address the concerns of omitted confounding shocks, they are more susceptible to refugees' self-selection based on unobserved locality characteristics. To tackle self-selection on unobservables, we develop a matching approach that only compares spatially contiguous municipalities, which, arguably, share similar initial level of development and are exposed to similar shocks. We further estimate a propensity score estimator that, by matching municipalities on both spatial contiguity and geographical features, allows geographical factors to have non-linear and non-additive effects on economic development. Reassuringly, we find no significant differences in the 1920 population density across contiguous municipalities with a greater or a lower number of refugees, conditional on geography. This suggests that these localities had a similar level of prosperity before the resettlement of refugees.

All three estimation frameworks produce very similar results in magnitude and statistical significance despite the different identifying assumptions they entail. We find that localities that received a higher share of refugees in 1923 are more prosperous than other comparable localities today. We identify positive effects of refugee inflow on diverse measures of economic development in 1971 and 1991: settlement localities have higher levels of population density and economic activity (proxied by night light luminosity), their residents are richer (reflected by better dwelling quality), more educated, and have higher earnings. We also find that the resettlement of refugees significantly contributed to foster the process of structural transformation away from agriculture that the Greek economy experienced during the second half of the twentieth century. Municipal-level estimates suggest that a one-standard-deviation increase in the share of refugees translates into a 25% larger non-primary sector in 1971 relative to the low-refugee localities' average. Similarly, the resettlement of refugees is significantly associated with larger financial and manufacturing sectors and a higher share of high-skilled occupation in both 1971 and 1991.

Next, we turn to explore the mechanisms underlying the persistent economic benefits that refugees generated. We provide evidence in favor of three main channels of persistence: agglomeration economies, occupational specialization, and the introduction of new industrial know-how brought by refugees. In presence of increasing return to scales, the initial shock of the refugee inflow, by providing a large labor supply and increasing the market demand for goods and services, is likely to have fostered the emergence (or the expansion)

of the manufacturing sector. When agglomeration economies operate, wages and productivity increase with the size of the industrial sector, thereby attracting internal migrants from the rest of Greece into settlement localities of refugees. In line with this explanation, we find that, following the arrival of refugees, settlement localities experienced significantly higher population growth and higher internal net-migration during the second half of the twentieth century. We also find that, in line with the core-periphery structure induced by agglomeration effects, places of settlement tended to specialize into manufacturing while nearby localities (with less refugees) specialized relatively more into agricultural production. These spillover effects on the sectoral specialization of neighboring localities did not result, however, in a decline in long-run prosperity in the nearby localities. On the contrary, we find evidence of positive spillover effects on night light luminosity and household wealth in nearby localities.

Second, the benefits of the refugee inflow may have been partly driven by an efficient specialization of refugees and natives in occupations in which they had a comparative advantage, i.e., agriculture for refugees and non-agriculture for natives. In line with this explanation, we provide evidence that the refugee inflow led Greek natives to shift their labor towards non-agricultural occupation in the short-term between 1920 and 1928, thereby leaving refugees to take their place in agricultural tasks.

Finally, although refugees were mostly low-skilled workers, some of them played a major role in the development of new industries that did not exist previously in Greece. Some refugees brought with them new knowledge and know-how, most notably in the textile industry – introducing silk and woolen materials and carpet-making – as well as in the tobacco production (which tripled in the 1920s and became a major export crop in the 1930s, accounting for 55% of the exportations). Using employment data by 3-digit industry categories from the 1991 census, we find that the textile and tobacco industries persistently account for a larger employment share in settlement localities. These industries may have contributed to long-term growth possibly through trade and positive spillovers along the production chain.

We also examine three alternative explanations for our results and find no evidence in favor of either of them. The Greco-Turkish Peace Treaty of 1923 implemented a compulsory population exchange that forced not only Greek Orthodox to resettle from Turkey to Greece but also half a million Muslim Turks from Greece to Turkey. Because a large part of the Greek refugees were settled in the lands and villages that were formerly occupied and left

behind by Muslim Turks, the inflow of refugees and the outflow of Turks are very correlated across localities. Therefore, we first examine whether the economic legacy of former Muslim minorities could explain our results. Second, the resettlement policy of the RSC was to redistribute the large land estates owned by the Turks into smallholdings, as well as to undertake drainage and infrastructure works (roads, bridges, and dispensaries), which could have per se fostered growth in settlement localities, independent of the potential benefits brought by refugees. We test for both explanations and find no evidence in favor of either. We finally address the concern that the correlations we uncover are driven by a composition effect due to a higher economic success of refugee families and their descendants (relative to native Greeks). Using survey data on second-generation refugees, we find no empirical support for this hypothesis.

In sum, our estimates are consistent with a narrative that, by providing an ample workforce and introducing new know-hows that are beneficial for the manufacturing sector, refugees created favorable conditions for early industrialization and economic development, which continues to persist today. Our findings shed some light on the effectiveness refugee resettlement policies in a context of a relatively poor agrarian economy, similar to contemporary Sub-Saharan Africa which currently hosts the largest number of forcibly displaced people (UNHCR, 2016) . Although we cannot provide direct empirical evidence for them, at least three features of the RSC's policy has a potential to have played a major role in shaping the beneficial effects that Greek refugees had on the localities in which they settled: (i) refugee households were given houses, arable land, livestock, seeds, and agricultural tools to live, work, and maintain themselves; (ii) there was a conscious effort to maintain the same homogenous communities of origin, as opposed to resettle refugees as individuals; and (iii) all refugees were granted the Greek citizenship immediately upon arrival, which facilitated their social and political integration.

Related literature. Our paper speaks to two sets of literature. First, we contribute to the small but growing literature on the effects of immigration on long-run economic development. Our findings of the long-term benefits of refugees within Greece complement studies that find long-term benefits of historical European immigration in Brazil (Rocha, Ferraz and Soares, 2017) and Argentina (Droller, 2017). Differently from our context where Greek refugees were less educated than the native population on average, the age of mass migration in Latin America brought high-skilled European settlers with much higher human capital than

natives. Our study is also related to the large literature on the consequences of the Age of Mass Migration for the U.S. (Abramitzky, Boustan and Eriksson, 2014) and more closely to the recent work of Sequeira, Nunn and Qian (2017) which documents the long-run impacts of European immigrants of the 19th century on economic prosperity. The authors show that immigrants facilitated economic growth in the long-run by providing an ample supply of low-skilled workers necessary for early industrialization and by introducing new knowledge and know-how that were beneficial for the manufacturing sector and increased productivity. Our paper also relates to a set of studies which find that migration-induced population shocks during and after World War II were highly persistent, with positive effect on industrialization and wages. Sarvimäki (2011) shows that the inflow of forced migrants into rural areas of Finland had a reinforcing effect on post-war population growth. Focusing on the influx of millions of German expellees to West-Germany, Schumann (2014) and Braun and Kvasnicka (2014) show that expellees had persistent effect on municipality population size and fostered Germany's transition away from low-productivity agriculture.

Second, we contribute to the literature examining the effects of forcibly displaced people, as opposed to immigrants for which the decision to leave, the destination location, and the timing of departure are usually choice variables. Refugees are also likely to have different characteristics than economic migrants because, fleeing wars and persecutions, they do not select into migration, leave their property behind, and cannot rely on family (or community) networks at destination, as it is the case for Greek refugees in our context. The few studies looking at how sudden inflow of displaced persons affects host communities have so far focused on the short-effects (e.g Braun and Omar Mahmoud (2014)) – see Ruiz and Vargas-Silva (2013) for an overview.[1] We therefore contribute to this literature by taking a historical perspective and examining the long-run economic consequences of a large-scale forced resettlement.

[1]This literature has so far focused on the effects of refugees on labor market outcomes (Braun and Omar Mahmoud (2014); Calderon and Ibañez (2009)), local food prices (Alix-Garcia and Saah, 2010), land use patterns (Alix-Garcia, Bartlett and Saah, 2013), consumption level of the local population (Maystadt and Verwimp, 2014), as well as on transmission of malaria in receiving areas (Montalvo and Reynal-Querol (2007)). See the literature review by Ruiz and Vargas-Silva (2013) for details. An exception is Baez (2011) who examines the impact of hosting massive wave of refugees from Burundi and Rwanda on the human capital and health of children in Tanzania.

2 Historical Background

2.1 The Population Exchange

The Kingdom of Greece gained independence from the Ottoman Empire in 1832. After her independence, Greece pursued the goal to unite ethnic Greeks by acquiring the Ottoman territories in which Greek Orthodoxes have been present for three millennia. Following the irredentist aspiration of the "Megali Idea", Greece expanded its territory by annexing Thessaly in 1881 and Macedonia and Epirus in 1913 after the Balkan Wars.

Greece officially joined the Allied forces in the First World War (WWI) in June 1917. After the victory of Allies in WWI, she laid her claims to the Ottoman Turkish territories which were heavily populated by ethnic Greeks, such as Cappadocia, western Asia Minor and Thrace, and Pontus – see Figure A.1 in Appendix. Backed by the Allies, Greece started the Ionia expedition and, by the end of summer 1921, Greek Army controlled the port of Smyrna [Izmir], occupied Thrace and most of the western Asia Minor. Greek advance stalled as the military and diplomatic support of Allies for the campaign faded, and the Turkish army counter-offensive in summer of 1922 revealed successful. As the Turkish army advanced, the Greek population of western Asia Minor fled to Greek Islands in response to the persecutions of Orthodox communities and the fire in Christian quarters of Smyrna. Almost one million Greeks, whose ancestors have been living in Asia Minor for 3 millennia, left Turkey within a few months time.

Among the agreements of the Lausanne Peace Treaty of 1923 that ended the war was the Convention for the Exchange of Populations, which, for the first time in modern history, devised and implemented the principle of a compulsory exchange of peoples. The convention dictated that all Orthodox Greeks living in Turkey and all Muslim Turks living in Greece were to be denaturalized, leave the country they reside in, and acquire the citizenship of their destination country.[2] It retroactively affected refugees who had already fled to Greece. As a result, Greece, a country with less than five million inhabitants, received almost one and a half million Greek refugees from Turkey. In return, about 500,000 Muslims left Greece together with a smaller number of Bulgars – see Figure A.1 in Appendix.[3]

[2]The Muslims of Western Thrace and the Greeks of Constantinople were exempt from the exchange. With the Treaty of Lausanne, Greece and Turkey also decided on exchanging the wealth of the exchanged populations. Therefore, Greece seized control of the properties abandoned by the Turks who left.

[3]Another population exchange of much smaller-scale took place between Greece and Bulgaria in 1920.

2.2 Resettlement of Refugees in Greece

The Mandate of the Refugee Settlement Commission

Because the relief and settlement of such a large scale refugee inflow were far beyond the limited resources of the Greek state at the time – which had almost gone bankrupt after a long and costly war – the League of Nations intervened and founded the Refugee Settlement Commission (RSC) in September 1923. The RSC had full authority over the distribution of funds and resettlement of refugees.[4]

Rural vs. Urban Settlements. The mandate of the RSC was to establish the refugees in productive work and assist them to become self-supporting in the minimum required time. Agricultural settlement was given priority by the RSC as the easiest and most effective method to reach this goal. The most important essential of such a program was to resettle refugees immediately on vacant lands suitable for cultivation. In addition, the RSC provided refugees with houses, livestock, seeds, agricultural machinery and tools necessary for cultivation (Kontogiorgi, 2006, pp. 78, 86, 90).[5] By contrast, the refugees who had been settled in urban centers (about 50% of the total number), apart from accommodation, were given no other means of providing for themselves (Kontogiorgi, 2006, pp. 103).

Resettlement of Origin Community. The refugees were organized, by the government or by themselves, into groups according to the origin of their community. They had to form legally constituted groups and designate representatives to which the RSC assigned a place of settlement. Cases of individual settlement were very rare (Kontogiorgi, 2006, pp. 141). According to E. Kontogiorgi, the resettlement process and *the general organization of refugee group was set within an institutionalized framework*, which, in effect, *left little if any scope for choice, on the part of the refugees, as regards the place of their final resettlement*

After the First and Second Balkan wars (1912-1913) which reshuffled the Greek and Bulgarian territories, the two countries agreed on a reciprocal and voluntary exchange of their respective racial, religious and linguistic minorities at the 1919 Convention in Neuilly-sur-Seine. According to estimates provided by the commission supervising the migration, about 90,000 Bulgarians left Greece and 50,000 Greeks left Bulgaria (R., 1944)

[4]Even though the League of Nations did not directly provide the funds for the settlement, by establishing the RSC, it provided international creditors with a guarantee that the loans granted for the resettlement of refugees would be properly administrated and effectively spent only for the refugees.

[5]Most of the houses occupied by the refugees were houses evacuated by the the displaced Muslims and Bulgarians. Some houses newly constructed buildings, often rudimentary

(Kontogiorgi, 2006, pp. 143) (emphasis added).

Agricultural Resettlement Policy

Despite solving the housing problem, settlement of refugees in rural areas also required arable land that could be allocated to them to help them reach self-sufficiency.

Land Reform. The government undertook a radical agrarian reform, through the redistribution of large estates into smallholdings, to expand the arable land that can be distributed to refugees. The reform mostly affected the large tracts of arable land owned by the Muslim Turks, known as the *chiftliks* estates that were cultivated by Greek families under a crop-sharing tenure system during the Ottoman Empire. To a lesser extent, the Greek State also expropriated some of the native population to free additional land for the refugees. This included people who had purchased or occupied the land left over by expatriated Muslims. Ultimately, out of the 850,000 hectares that the Greek State transferred to the RSC by 1929, less than 10% were acquired by expropriation of Greek citizens or alien subjects, while the rest was taken from land left behind by displaced Turkish landowners (Kritikos, 2005).

Determinants of Final Place of Settlement. The absorption capacity of host localities largely dictated where refugees were settled in Greece. Most of the agricultural settlement was effectuated in Macedonia and Thrace where large tracts of fertile land, abandoned by the Muslim Turks, were available and sparsely populated. The RSC planners determined settlement's location by assessing the absorption capacity of available land using soil attributes and topography. As C. B. Eddy, the last president of the RSC remarked: *"This distribution was determined by several quite patent factors, of which the geographical was the controlling one. The capacity of the country in the absorption of refugees was limited by its physical features. After 1924, the organization of the Commission became intensive and [..] knowledge of the country in all its parts, of its natural resources and of its capacity for absorption of the new population became precise. Consolidation of the new village units upon the holdings allotted to them proceeded rapidly, and was accompanied by many movements within the population itself, as the scattered inhabitants of the old villages in Asia Minor tended again to unite"* (Kontogiorgi, 2006, pp. 255). Yet, many refugees who were initially placed in agricultural settlements came from urban centers in Turkey. Not having been used to heavy agricultural labour, most of them did not remain in their initial settlement and

moved into cities (Kritikos, 2000).

Drainage and Other Infrastructure Works. The second strategy of the RSC to facilitate the resettlement was to increase the size of arable lands by implementing important drainage and reclamation works in the Northern Macedonia provinces (mainly Macedonia). Under Ottoman rule, Macedonian valleys were often waterlogged and prone to malaria, and therefore under-used by the Turkish landlords, despite made of fertile soil. Christian populations preferred living in the highlands where the foothills provided natural drainage and a constant supply of water from mountain streams. Once reclaimed by the RSC, the drained marshlands hosted many new settlements where refugees who could exploit the rich arable tracts of land in the plains. In total, with the land redistribution and the reallocation of land use (from highlands to plains), the total area under cultivation doubled in Northern Greece (Kontogiorgi, 2006, pp. 277-290).

In addition to distributing land and houses to refugees, the RSC also initiated a public utility program: it constructed roads, bridges, dispensaries, and schools (Pentzopoulos 1962, p. 108; Kontogiorgi 2006, p. 297). The decennial 1922–1932 total budgetary expenditures for the relief, housing and settlement of refugees amounted to a little more than 10 millions British pounds, with 9.1 millions spent for agricultural settlement and 1.3 millions for urban settlement (Kritikos (2005); Pentzopoulos (1962)). This amount represented between 3 and 4% of Greek GDP.[6] For the agricultural resettlement, these figures mean that the RSC spent about 1500 US current dollars per rural refugee (half of the refugees).

2.3 New Know-How and Skills Brought by Refugees

According to historical records, refugees brought three new major types of industry into Greece: tobacco production, manufacture of silk fabrics, and carpet production. According to Henry Morgenthau, the chairman of the RSC, refugees produced two-thirds of the total tobacco production in Greece in 1926. He noted that wherever combination of soil and climate was favorable, refugees planted tobacco. Thus about 14 percent of all the peasants were engaged in tobacco cultivation (Kritikos, 2005). Tobacco became the major export crop in the 1920s, and in tobacco-growing areas, the production increased sixfold "thanks to

[6]At the end of the1920s, the Greek gross domestic product was about 14 billion in 1990 US dollars according to Maddison (2010), or about 320 millions in 1930 pounds.

intensive cultivation by refugees who were experienced cultivators of tobacco in their country of origin" (Kontogiorgi, 2006, p.308–9).[7] This industry was of special interest to Americans, as the United States absorbed most of the crop and used it "in American cigarette factories, where it was blended with the native American tobaccos to provide a more delicate aroma" (Kritikos, 2005).

Refugees were also experienced silkworm breeders who immediately engaged in it upon arrival in Greece. According to H. Morgenthau, refugees largely developed the growing of silkworm and the manufacture of silk fabrics in Greece (Kritikos, 2005). In addition, one of the important contributions of refugees was in the field of carpet-making. In the words of D. Pentzopoulos, "various types of carpets were manufactured [...] competing successfully in the international market and bringing into Greece 400,000 pounds annually. It was really the birth of a new industryWW (Pentzopoulos, 1962, p. 163).

2.4 Cultural and Economic Tensions with the Natives

Cultural and Linguistic Differences. Many of the refugees had little or no consciousness of being Greek. Their expulsion was based on their adherence to the Christian-Orthodox church. League of Nations officials noted that some refugees spoke little or no Greek and displayed a large variety of languages, dialects, and customs (Hirschon, 2003; Triadafilopoulos, 2003).[8] When locals and refugees first came into contact and realized how very different they were, they suffered what Mavrogordatos (1983) described as "a traumatic cultural shock". The ethnic boundaries separating refugees (*Prosphyges*) and their hosts (the "Old Greeks", *Palioelladites*) were sufficient to cause strife and prejudice, particularly as "competition for land and livelihood lowered the standard of living for everyone" (Kontogiorgi, 2006, p. 166).[9] During the inter-war period mixed marriages between refugees and natives were rare. The predominant reasons for this was a tendency towards intermarriage among refugees. The natives, on the other hand, "regarded the newcomers as a sickly lot and looked upon them with contempt and suspicion" (Kontogiorgi, 2006, p. 160).

[7]Tobacco was also produced by Muslim Turks but to a much smaller extent according to Kontogiorgi (2006).

[8]Greeks from Cappadocia region in Turkey did not speak Greek. According to the Ottoman census of 1914, they were about 6% of the 1.5 million of Orthodox Greeks.

[9]Even though the two groups involved had common religious bonds, they constituted two different cultural identities. The refugees were typically derided for their cultural heterogeneity. Natives referred to the refugees as "Turkish seed" (*Tourkosporoi*) and "baptized in yogurt" (*giaourtovaftesmeni*).

Conflict Over Land Distribution. This rural settlement triggered conflicts over the expropriated land. The fragmentation of farmland into smallholding created tensions between native cultivators, who either bought or occupied the land abandoned by the Turks, and the refugees who were allocated in these areas by the RSC (Kritikos, 2005). The indigenous landless peasants had for a long time nurtured expectations of becoming owners of the land abandoned by the Turks, which they had been cultivating for generations in many cases. Serious clashes with refugees were inevitable when almost all of the former Turkish estates were transferred to refugee families and virtually none were redistributed to the native landless peasantry.

Political Cleavage in the Inter-War Period. The Liberal Party led by E. Venizelos quickly recognized the importance of refugees' votes and worked for the integration of the refugees into the Greek political system. The refugees became an integral part of the Venizelist camp (Pentzopoulos, 1962, p. 186). Partly due to their exclusion from native patron-client networks, *the refugees rapidly developed their own political machines, headed by refugee or pro-refugee politicians and enjoying access to the top Venizelist leaders (...) The refugees justifiably saw the Venizelist Republic as "their" regime, and the Liberal Party particular as "their" party* (Mavrogordatos, 1983, p. 202). The Venizelists' embrace of the refugees caused a conservative backlash against the newcomers, who were often denied their status of "true" Greeks. The hostility against the refugees reached its apogee in the election of 1928 which the Liberal Party won thanks to the refugees' votes. Anti-venizelists accused the refugees of depriving the native majority of its legitimate political power and demanded the exclusion (or segregation) of the refugees from the political process. As Mavrogordatos (1983) puts it, *"the distinction between refugees and natives provided the basis for the most salient cleavage in inter-war Greek society, which truly dominated the politics of the period."*

3 Data and Location of Settlements

3.1 Data

The main hypothesis we test in this paper is whether the localities that hosted a greater inflow of refugees have a different level of development in the long-run. To this end, we assemble a novel dataset at a very disaggregated administrative level that combines historical data on

refugee resettlement with contemporary socio-economic outcomes. Throughout this study, we focus on areas that were rural at the time of the resettlement, as self-selection of refugees was more pronounced in urban areas, where they were over-represented. We exclude from the sample the localities that were defined as cities in statistical publications in 1920s.[10]

3.1.1 Historical Population Data

Our primary source of historical population data is the published results of the 1928 census. It allows us to identify the spatial distribution of refugees both at the province (*eparchia*) level, i.e., third sub-national administrative units, and at the community level. We consider the population share of refugees in 1928 as our main treatment variable and conduct the empirical analysis both at the province and municipality level.[11] Panels (a) and (b) of Figure 1 visualizes the distribution of the share of refugees in 1928 at the province and community level, respectively.

The 1928 census provides information on the socio-economic characteristics, i.e., three-digit professions and literacy rate by age, of the *total* Greek population and those of the refugees separately at the province level (and also for cities as defined in the 1928 census). Moreover, for each province, the 1928 census provides information on the characteristics of the population in 1920 for comparison, albeit aggregated at broader categories: one-digit professions and literacy rate by five-year to ten-year birth cohorts. It also tabulates the number of Muslim Turks and Bulgarians that left Greece between 1920 and 1928 at the province level (and at the city evel). We complement these data with the total population in 1920 at the commune level, which comes from the published results of the 1920 census. Unfortunately, no breakdown of the socio-economic characteristics of the population by ethnicity or religion in 1920 exists.

We combine the pre-settlement socio-economic characteristics of communities and of provinces with their geographical features and investigate the determinants of the location of the refugee settlement in subsection 3.2. We also document the characteristics of refugees

[10] 59 municipalities were classified as cities in the 1928 census. Refugees were disproportionality over-represented in cities where they accounted for 27% of the population relative to 12% in rural localities. Moreover, we exclude the province of Athens from our analysis as it is likely to have a different development trajectory than the rest of Greece. We also exclude Mont Athos from our analysis as it is under the direct jurisdiction of the Ecumenical Patriarch of Constantinople.

[11] When we aggregate our data at the province level, we exclude urban municipalities both from the computation of the share of refugees and other characteristics of localities in 1928. The same principle applies to the construction of contemporary outcome variables and other controls.

and the difference between refugees and natives in terms of professional choices and literacy rates in subsection 3.3.

3.1.2 Contemporary Outcomes

Our primary source of data on contemporary outcomes are the results of the 1971 and 1991 censuses provided by the Hellenic Statistical Authority (ELSTAT). These censuses provide information on population size, education level by age, occupational choices of the working age population, and dwelling characteristics at the municipality level. We complement these with top-corrected night lights data (Bluhm and Krause, 2017).[12] The resolution of the top-corrected night lights data is 30 by 30 arc seconds. (30 arc seconds equal approximately 1 km at the equator). On average, 40 pixels fall within municipality borders, and for 97.5 percent of municipalities there are more than 5 pixels that fall within municipality borders.

We use population density and luminosity per square kilometer as proxies of contemporary local economic development. We consider the dwelling quality at the local level as another set of measures of economic development; we compute the share of dwellings with amenities such as electricity, sewage, bathing facilities, and tap water inside the house. We also investigate the effect of refugee inflow on labor market outcomes and human capital accumulation at the local level. We compute the completion rates of primary, secondary, and tertiary education levels, labor force participation in agriculture and non-agricultural sector, and share of financial sector (finance, accounting, and insurance), manufacturing, and other high-skilled occupations (professional or executive managerial occupations) among employed. Unfortunately, census results do not provide information on income. We match the occupation-gender pairs (45 x 2) that exist in the 1991 census to the Greek Labor Force Surveys of 1999–2002. We assign to each occupation-gender pair a value representing the median total income of all relevant persons with that particular occupation according to the Greek Labor Force survey in 1999–2002. As an alternative measure, we compute the share of those employed in top earning occupations, i.e., the ten occupations with the highest median earning.

We consider agglomeration effects and the persistence of industries that were introduced

[12]We focus on the level of development before 1997 – the year in which a major administrative reform, known as the Kapodistrias reform, took place and reorganized country's administrative divisions. Between 1928 and 1997, the administrative organization of Greece was very stable and the municipality borders has not drastically changed.

by refugees, such as textile and tobacco processing, as potential mechanisms. We compute the population growth between 1928 and 1971/1991, internal migration rates across localities within Greece, and also the employment share in textile and tobacco sectors in 1971 and 1991.

3.1.3 Former Muslim–Turkish Settlements

To identify the former Turkish localities in Northern Greece, we use an ethnographic map from Güvenc (2010).[13] This map represents the population distribution of different ethno-religious groups in Macedonia in August 1915. We identify a match for 92.4% of the 780 communities that were tabulated in the published report of the 1920 census in the provinces covered by the map.[14] We code the information provided by the map as two indicator variables: *mostly muslim* and *some muslim*. The former indicates whether the Muslim population represented about 75% or more of the population of a locality, while the latter indicates whether Muslims a non-negligible share of its population, i.e., about 25% or more.

We validate the reliability of information coming from the ethnographic map by examining the change in the population between 1920 and 1928 in these localities. We expect localities coded as former Muslim localities to experience a decline in their population between 1920 and 1928 if we do not take into account the inflow of refugees into these localities. 118 of the 121 *mostly muslim* localities experienced a loss in their population – a total of 131,412 inhabitants. Similarly, 165 of the 175 *some muslim* localities experienced a loss in their population – a total of 187,986 in habitants.[15] Moreover, we expect these localities to experience a substantial inflow of refugees as there was more free land and housing thanks to the departure of Muslim Turks. 79% and 66.5% of the population living in *mostly muslim* and *some muslim* localities in 1928 are refugees, respectively. Overall, these cross-checks between two data sources suggest that the ethnographic map could serve as a reliable source of information to identify the presence of Muslims before the population exchange.

[13]The title of the map reads: "Carte ethnographique de la Macedoine Grecque: presentant la repartition ethnique au mois d'aout 1915"

[14]The map represents all the localities in Kozani, Drama, Florina, Pella, Thessaloniki, and Serres departments and some localities in Elassona province of Larissa department.

[15]Please note that these numbers do not take into account potential net population growth due to birth and death and therefore are lower bound estimates.

3.1.4 Matching 1920–1928 censuses at the community level with 1971–1991 censuses at the municipality level

Many localities in Greece were affected by the arrival of refugees. Some communities were founded as a part of the refugee settlement; others were merged to form one because of the outflow of population. Also, some localities changed name after the arrival of refugees as the population structure of the communities were affected to a great extent. Moreover, some localities were split into more than one settlement as they grew in terms of population over time.

We matched the communities that existed in 1928 to both the community level data in 1920 and to the municipality level data in 1971–1991. We followed the following procedure to match the communities that existed in 1920 to those existed in 1928. First, we match them by community and province names or by community and department names (considering only provinces that are adjacent to one and other within a department). If such match does not exist, this means either of the following options: (1) name of the community changed between 1920 and 1928; (2) community ceased to exist or was merged to another existing community between 1920 and 1928; (3) community in 1928 was founded between 1920 and 1928. To identify which of these scenarios is the case and find the correct match, we relied on information provided by the database of Hellenic Agency for Local Development and Local Government (EETAA) on "Administrative Changes of Municipalities and Communities". This database provides detailed information on the date of foundation of communities, their border and name changes if there was any, and information on whether the community was transferred from one department to another if such transfer took place.[16] To match communities that existed in 1928 to the municipality level data in 1971–1991, we followed the same procedure but additionally we made use of the 1948 Atlas of Greece, especially in cases when two communities with the same or very similar names existed in a given province.

Using this procedure we matched 5,007 of the 5,041 communities that existed in 1928 to the 4,615 communities that existed in 1920. 30 of the 34 unmatched communities were founded between 1920 and 1928. We identified that 386 communities that existed in 1920 merged into 171 communities between 1920 and 1928. Also, we matched 4,845 (96.1%) of

[16]Figure A.2 in Appendix provides an example entry for the community Abderon translated in English. We also used the National Hellenic Research Foundation's Pandektis database on the name changes of settlements in Greece between 1913-1996, which can be accessed through the following link: http://pandektis.ekt.gr/pandektis/handle/10442/4968

the 5,041 communities that existed in 1928 to the 5,847 municipalities that existed in 1991 and was a part of Greece as of 1928.[17] We identified that 59 communities that existed in 1928 merged into 16 communities between 1928 and 1991. We collapse our dataset at the administrative borders of 1920 and treat observations that merged after 1920 as a single unit. We obtain a panel data set of 4,306 different municipalities/communities (or clusters), achieving a match of 98% of the 1928 population.

To have a map of municipalities/communities in 1928 we start with a shapefile showing the boundaries of municipalities in 1991.[18] Using the correspondence map of the municipalities between 1928 and 1991 obtained through the process described above, we merge boundaries of the municipalities in 1991 that were a part of the same municipality in 1928 to a single unit to approximate the boundaries of municipalities in 1928. We then use these boundaries to compute the geophysical features of municipalities and to identify bordering municipalities in 1928.

3.2 Determinants of Settlement Locations

We analyze the determinants of refugees' settlement locations before investigating the long-term effect of refugee settlement.

Geographical features. Table A.1 in Appendix examines how geographical features are able to predict the share of refugees in 1928 at the province level. Our data reveals that RSC planners selected as place of settlement provinces that are more favorable for agricultural production in terms of topography (i.e., less elevated and closer to river) and suitability for rain-fed agriculture, but somehow with shorter length of growing period (LGP), i.e., the number of days during the year when both moisture availability and temperature are conducive to crop growth. Suitability for agriculture alone explains 29% of the variation in share of refugees across provinces. Conditional on geographical characteristics of provinces, the share of refugees in 1928 is not related to being closer to the railway network in 1920.

Pre-settlement economic characteristics. Table A.2 in Appendix investigates whether the provinces that received a greater share of refugees were more or less developed relative to

[17] Please note that Dodecanese islands joined Greece in 1947 and are excluded from the sample.

[18] This shapefile can be accessed through: http://www.geodata.gov.gr/en/dataset/developers/oria-ota-pro-kapodistria. Last accessed on October 31, 2017.

others before the population exchange. Conditional on the same geographic characteristics of provinces as in Table A.1, the share of refugees in 1928 is not related to population density in 1920, which we view to be as a good proxy for prosperity, especially in the pre-industrial Greece of the 1920s (following Acemoglu, Johnson and Robinson (2002) and a large literature that consider urbanization as a hallmark of economic development (Bairoch, 1991; Kuznets and Murphy, 1966)), whereas it is positively associated with the share of Muslim Turks (and Bulgars) in 1920. This is consistent with the historical anecdotal evidence that the availability of vacant land and houses left behind by the Turks was one of the main determinants of settlement location.

Conditional on geography, an increase in the share of refugees in 1928 is positively correlated with a greater share of agriculture in employment and a lower literacy rate in 1920, however it is unrelated to the share of agriculture in employment among natives and literacy rate of non-refugees in 1928. This contrast suggests that the correlations we identify between the share of refugees in 1928 and socio-economic characteristics of the 1920 population is due to the presence of Muslim Turks in northern provinces in 1920. Turks were much less literate (and more agriculturalist) relative to the Greek natives (Glavinas, 2009, pp. 294–310).[19,20]

Table A.3 in Appendix examines whether the communities/municipalities that received a greater share of refugees were comparable in terms of geography and initial level of prosperity. Consistent with the province level findings, settlement municipalities on average are more favorable for agricultural production, even conditional on province fixed effects. They are less elevated, more suitable for rain-fed agriculture, and have longer length of growing period compared to other communities. Distance to the railway network in 1920 is negatively correlated with the share of refugees in 1928, suggesting that accessibility of communities had a favorable effect on refugee settlement. We find zero unconditional correlation between the population density in 1920 and the share of refugee in 1928. However, conditional on geography, we find a negative correlation between the two, suggesting that settlement mu-

[19]The Greek authorities considered the Muslim education, especially in rural areas, as "primitive" in 1914. Most of the schools had only one grade, the preachers (*imams*) took the role of teachers and would mostly teach the Koran.

[20]When we restrict the sample to provinces of the "Old Greece" where almost no Muslim lived prior to the population exchange, we find no correlation between the share of refugees in 1928 and the literacy or occupational choices in 1920 (see Table A.4 in Appendix). This provides additional evidence that, conditional on geography, provinces of settlement were similar to others, and that the differences observed in socio-economic characteristics of the 1920 population (in Table A.2 in Appendix) are likely to be due to Muslim / Turkish presence in 1920.

nicipalities were less densely populated and probably less prosperous than other localities.[21]

We have so far documented that places of settlement had similar level of economic development than others localities before the population exchange (or if anything lower). However, it is possible that refugees were attracted to locations with more growth potential, rather than higher initial prosperity. We examine whether settlement localities were on divergent development path than other localities by looking at the pre-trends in the literacy rate of the native population across birth cohorts. Figure A.3 in Appendix presents the literacy rate of cohorts born between 1829 and 1918 by high-refugee and low-refugee provinces, defined by a threshold of 5% of the 1920 province population (corresponding to the top tercile of the distribution). Literacy trends are upward sloping across birth cohorts, and follow a very similar pattern between high- and low-refugee provinces. Parallel evolution of the average native literacy across generations suggests that provinces that received a greater share of refugees were on a similar development trajectory as other provinces.

3.3 Characteristics of Refugees and Non-Refugees in 1928

How different were refugees and non-refugees (hereafter natives) in terms of their socio-economic characteristics? Figure A.4 in Appendix visualizes the trends in literacy rate across birth cohorts, separately for refugees and natives. Male refugees were on average 10 percent less likely to be literate compared to male natives in their generation. This gap is by about 5% to 8% larger for the cohorts born between 1899 and 1913, i.e., the cohorts that were at primary school age during the Balkan Wars and the WWI. On average, there was no difference between the level of literacy of female refugees and and that of female refugees. However, female refugees born between 1899 and 1913 were about 10 percent less likely to be literate compared to female natives in their generation.

Figure A.5 in Appendix visualizes the share of refugees and natives with a profession in agricultural and non-agricultural sectors, separately for males and females. Female refugees were more likely to be employed in agriculture compared to their native counterparts, whereas both refugee and native females were as likely to be working in non-agricultural sectors, suggesting a larger labor market participation among refugee females. Male refugees were more likely to be employed in agriculture and less likely to be employed in non-agricultural

[21] Unfortunately, no data on literacy or occupation at the municipality level exists in the censuses of 1920 and 1928.

sectors compared to their native counterparts. Overall, these comparisons reveal that, if anything, the refugees who arrived from Turkey were on average less educated and more likely to be employed in agriculture.

4 Empirical Strategy

Estimating the long-run effects of the refugee inflows poses a host of empirical challenges. First, the criteria used by the Refugee Settlement Commission to select the site of settlement are not fully observed and one cannot *a priori* rule out that unobserved factors (either geographical or economic) related to resettlement locations affect long-term development. Second, as noted by historians Kontogiorgi (2006) and Kritikos (2000), many refugees did not remain in their assigned settlement location and families tended to sort themselves out in localities they considered offering the best opportunities. To address the concerns of endogenous selection into final places of settlement, we implement a series of empirical estimates which exploit different margin of spatial variation in the presence of refugees and rely on different identification assumptions that we discuss extensively in this section.

4.1 Province-Level Regressions

We start by analyzing the association between the inflow of refugees and long-term economic development in Greece by estimating the following equation at the province level:

$$Y_p = \beta_1 REF_p + GEO_p \alpha_1 + \varepsilon_p \tag{1}$$

where Y_p is the measure of today's prosperity in the province p, taken either from 1971 or 1991 census data (described in more detailed in the next section). The main regressor of interest REF_p is the log share of refugees in 1928, relative to the 1920's province population. Given the skewness of the distribution of the share of refugees (see Figure A.6 in Appendix), our preferred specification takes the log of the population proportion. The vector of control GEO_p includes the same geographical variables as Table A.1: distance to the railway network in 1920, distance to rivers, mean elevation, precipitation, temperature, length of growing season, and suitability of crops for rain-fed agriculture.

The inflow of refugees is correlated with the outflow of Muslim Turks and one would like

to disentangle the two effects. In section 6, we estimate the marginal impact of the inflow of refugees controlling for the outflow of Turks at the province level or the presence of a sizeable Muslim Turkish minority at the municipality level, and find very similar effects that those obtained with specification (1). Moreover, in section 6, we restrict the sample to provinces where almost no Turks lived in and find similar effect of refugees.

Specification (1) identifies causal effect of refugees if the selection into settlement provinces was as good as random, conditional on observed geographical features. Although we cannot prove this assumption formally, evidence presented in section 3.2 suggests that, before the population exchange, provinces hosting more refugees had similar initial level of economic development as other provinces in terms of population density, literacy rate and occupational structure. Also, they were not on a divergent development path (as parallel trends education in across provinces with varying levels of refugee presence indicate) relative to other provinces.

Nonetheless, because most provinces of settlement are concentrated on specific regions of Greece (the North and Crete), equation (1) relies on the comparison of provinces that are far apart and thus possibly exposed to heterogeneous shocks which, following the refugee inflow, may confound the OLS estimates (e.g., shocks due to World War II or the 1946-1949 Greek Civil war).

4.2 Municipality-Level Regressions With Province Fixed-Effects

We take advantage of the data we compiled at the municipality level to exploit variation in inflow of refugees within province, thereby estimating impacts of refugees comparing municipalities in close proximity. Specifically, we estimate the following regression:

$$Y_{mp} = \delta_p + \beta_2 REF_{mp} + GEO_{mp}\alpha_2 + \epsilon_{mp} \tag{2}$$

where Y_{mp} and is the a proxy of today's prosperity of municipality m in province p and REF_{mp} is the log share of refugees in the 1920 municipal population. Importantly, the specification includes now a set of province fixed-effects δ_p that controls for unobserved heterogeneity at the province level. The vector GEO_{mp} includes the same geographical variables as in specification (1), now measured at the municipality level. We correct standard errors for spatial correlation across municipalities following Conley (1999), assuming that the spatial correlation is null between municipalities that are more than 20 kilometers apart.

There are 47 municipalities within 20 kilometers-radius clusters on average.

While restricting the analysis to within-province comparisons addresses the concern of omitted confounding shocks, it raises the issue of refugees's self-selection. It is possible that refugees were attracted to locations with higher growth potential, and the extent of this self-selection might be particularly pronounced across close-by municipalities of the same province (located about 100 km apart maximum). However, historical records of the mobility of the refugee population across the Greek territory indicate that such mobility was essentially driven by urban refugees moving from one town to another, or from the rural settlements they were assigned to into the cities.[22] To minimize the possibility that self-selection of refugees into settlement municipalities affect our estimates, we exclude cities according to the statistical definition of 1928 from the estimation sample and focus only on rural municipalities.

4.3 Spatial Matching Estimates: Contiguous Municipalities

Given that provinces are large administrative units in which there is a substantial heterogeneity in terms of local development at the municipality level, it is still possible that the self-selection of refugees into settlement municipalities is based on unobserved characteristics that foster growth in the long-run, thereby generating a bias in the estimates of equation (2). To better tackle this issue, we develop a matching approach that relies on the comparison of spatially contiguous municipalities, which are arguably exposed to more similar economic conditions, natural environments, and shocks.

Spatial matching and propensity score

We begin by defining a treatment variable that takes the value of one if the number of refugees is more than 5% of the 1920 population, and zero otherwise. The 5% threshold characterizes a treatment group of 680 municipalities (about 15%) out of the universe of

[22] An RSC report stated that "*during three years at least, the urban refugees, urged by some strange instinct, were continually on the move. There are very few urban families which have not flitted again and again from one large town to another in order to see with their own eyes the possibilities offered by each locality visited.*" (League of Nations, C.406.M.126, Nineteenth Quarterly Report of the Refugee Settlement Commission, Athens, 15 August 1928 (Geneva, 22 August 1928), pp. 22-23.). According to (Kontogiorgi, 2006, p257): "*Although refugees from urban centers were placed in a number of rural settlements in Macedonia during the resettlement period, in most cases their stay in the countryside was a short one. [...] The great majority abandoned the land they had been given at the first opportunity and moved into the cities.*"

4200 rural municipalities.[23] We test the robustness of the results by using the alternative thresholds of 10% and 2%.

Among the sample of untreated municipalities (with less than 5% refugees), we consider those that are spatially contiguous to (i.e., share a common border with) treated municipalities as control municipalities. For each treated municipality, we construct the counterfactual outcome as an average of the neighboring municipalities. Some control municipalities are used more than once to construct the counterfactual of different treated localities, we reweigh the control sample to account for this. The matching estimator of the average treatment effect is then obtained as:

$$\frac{1}{N_1}\sum_{T_i=1} Y_i - \sum_{T_j=0}\left(\frac{1}{N_1}\sum_{T_i=1}\frac{d(i,j)}{\sum_{T_j=0} d(i,j)}\right) Y_j \tag{3}$$

where Y_i is the outcome of municipality i, T_i the treatment status and N_1 is the number of treated. The regression weight of each control municipality j is given by $\frac{1}{N_1}\sum_{T_i=1}\frac{d(i,j)}{\sum_{T_j=0} d(i,j)}$, where $d(i,j) = 1$ if the municipalities i and j are contiguous and zero otherwise.

We examine whether treated municipalities present systemic geographical differences with respect to spatially contiguous untreated localities. Panel A of Table A.5 in Appendix show that treated localities are significantly less elevated and more suitable for rain-fed crops relative to neighboring areas. Treated localities are also more densely populated in 1920. This finding confirms that the absorption capacity of the land, thus its suitability for agriculture, was the determining factor of settlement locations at the local level. Since geography can independently affect long-run development, we need to control for the geographical factors in Table A.5, as well as for the 1920 population density. We do so in a non-parametric way, using propensity score matching.

We first estimate the probability of being treated (i.e., propensity score) as a function of the vector of geographical variables in Table A.5 in Appendix. Second, for each treated municipality, we select among the control group the contiguous neighbors that have the lowest difference in the propensity score with the treated locality. We drop the untreated neighbors that have a propensity score difference higher than a given threshold. We also

[23] About 30% localities hosted at least 1% of refugee relative to their population and can be thus considered as settlement localities. We chose the 5% threshold so that half of these settlement localities are included in treatment group. We avoid selecting much higher thresholds since this would reduce the number of treated municipalities and therefore reduce the precision of the estimates.

exclude clusters of contiguous treated-control localities in which the minimum propensity score difference is higher than this same threshold (i.e., clusters in which treated and control are geographically too dissimilar). We decide on a threshold such that we exclude 20% of the treated localities. We checked the robustness of the results to alternative values of this threshold. When we use this method, we correct standard errors for spatial correlation across municipalities following Conley (1999), assuming that the spatial correlation is null between municipalities that are more than 20 kilometers apart. We use the procedure developed by Colella et al. (2018) that allows for probabilistic weighting.

Panel B of Table A.5 presents the average differences in the characteristics of contiguous treated and control localities that are matched on the propensity score. Differences are always lower than 10% of a standard-deviation and statistically insignificant, which suggests that we successfully obtained a sample of contiguous localities that share very similar geographical and topographical features. Similarly, population density in 1920 is also almost identical across treated and control municipalities.

5 Results

5.1 Effects on Urbanization, Economic Activity, and Household Wealth

Given the absence of household income or GDP data at a high-resolution spatial level, we rely on several alternative measures of economic development. We consider population density as a proxy for urbanization and night light density as a proxy for local economic activity following Michalopoulos and Papaioannou (2013) and others. Columns 1 through 3 of Table 1 present the estimated effects of refugees on urbanization and economic activity. Each panel of Table 1 (and Tables 2, 3, and 4) presents a different estimate of the effect of refugees that correspond to a different econometric specification discussed in section 4. Municipality-level regressions in Panels B and C suggest that the refugee inflow is significantly associated with higher population density in 1971 and 1991, and with higher luminosity in 1995 (per square meter). The size of the coefficient in column (3) of Panel B implies that a one-standard-deviation increase in the log share of refugees (= 2.2) translates into a 10% standard-deviation increase in luminosity.

We next investigate the effects of refugees on household wealth that we measure by using

data on dwelling characteristics and utilities in 1971. We specifically focus on four indicators that conventional methods typically rely on (in addition to asset variables) to construct composite indexes of household wealth (Filmer and Pritchett, 2001). Such indicators include the presence, in the dwelling, of: (i) electricity, (ii) a proper sewage network connected to the house (as opposed to other sewage systems like a sink or no sewage at all) (iii) water supply inside the private interior space (as opposed to water supply in the communal or open space in the building), and (iv) bathing facilities inside the house. Estimates in columns 4 through 7 of Table 1 consistently point to a positive effects of refugee on each of these four wealth indicators. Effects are not only statistically but also economically significant: Panel B coefficients imply that a one-standard-deviation increase in the log share of refugees is associated with a 2.4 points increase in the share of dwellings with a bath or shower inside the home, which equals a twofold increase relative to the average in low-refugee municipalities (with less than 1% refugees). A same level of increase in the log refugee share translates into a 50% increase (6 percentage points) in the share of dwelling with water supply relative to low-refugee municipalities.

5.2 Effects on Sectoral Transformation

We next turn to the analysis of the structural transformation away from agriculture that the Greek economy experienced during the second half of the twentieth century. While agriculture represented 80% of the total employment in 1928, the employment share of primary sector dropped to less than 30% by 1991. How did the refugee inflow affect this process of sectoral change? Did refugees foster or undermine sectoral change in settlement localities?

Table 2 explores the effects of refugees on the labor force participation in agricultural and non-agricultural occupations among the 20-50 years old in both 1971 and 1991. The logic behind restricting the sample to people below 50 years old is that almost of all these individuals are all born after the inflow of refugees in 1923 (and thus are not refugee themselves), which rules out any mechanical composition effect. A higher share of refugees in 1928 is significantly correlated with both a lower participation in agriculture and a higher participation in non-agricultural sectors both at the municipality and province level. This finding holds both in 1971 and 1991 and irrespective of the chosen econometric specification. The estimate in column 3 of Panel B implies that a one-standard-deviation increase in the

the log share of refugees leads to a 2.5 percentage points increase in the 1971 participation in the non-primary sector, equivalent to a 18% increase relative to the average among low-refugee localities. In terms of employment share, a one-standard-deviation increase in the log refugee share translates into a non-primary sector 25% larger relative to the low-refugee localities average, which is a sizable effect.[24]

Are second-generation refugees more likely to work in the non-agricultural than sons of native Greeks, thereby partially accounting for the estimates of Table 2? Refugees were on average *less* likely than natives to work in the non-agricultural sector upon arrival (see Figure A.5). While it is possible that sons of refugees climb the occupational ladder out of agriculture, there is no reason to expect that the process of upward intergenerational occupational mobility should be more pronounced among refugee families than among native Greeks. In section 6, using survey data, we provide evidence that second-generation refugees are as likely to hold non-primary occupation as sons of Greek natives after World War II.

5.3 Effects on Non-Primary Occupation and Earnings

Table 3 explores the effect of refugees on the relative importance of non-primary industries and high-skilled occupations. We begin by exploring the effects of refugees on the employment share of two crucial sectors for long-term development: the financial sector (including law, accounting and insurance) and the manufacturing sector. Estimates in all panels consistently indicate that localities with more refugees in 1928 have a significantly larger financial and manufacturing sectors in 1971. The coefficient in panel B implies that a one-standard-deviation increase in the log refugee share is associated with a 1.14 point increase in the manufacturing employment share, which represents a 30% increase relative to low-refugee localities. Using employment data by occupation instead of by industry's type, we find that the refugee inflow is significantly associated with a higher share of high-skilled occupation in 1971 (defined as professionals or executive managers).

We then turn to the 1991 earnings, which we compute by assigning to each 2-digit occupation and sex pair from the 1991 census, a value representing the median monthly wage of all relevant individuals with that particular occupation and sex, according to the 1999–2002

[24] Noting A and N the labor force participation in primary and non-primary sector, we have that $d\frac{N}{N+A} = \frac{AdN-NdA}{(N+A)^2} = \frac{52*1,5+2,2*14}{(52+14)^2} = 0,0249$ and multiplied by one-standard-deviation of refugee share gives 0,0549 points, or 25% of the non-primary employment share ($\frac{14}{14+52}$ =21%).

Greek Labor Force surveys. Irrespective of the empirical specification, we find that localities with more refugees have significantly higher occupational earnings today. The panel B estimate implies that a one-standard-deviation increase in the log refugee share leads to a 20% standard-deviation increase in municipal average earnings (computed conditionally on being employed). We examine whether this effect is entirely due to the lower share of agricultural occupations in high-refugee localities by looking at the proportion of top-earning occupations, which are all in the non-primary sector. All specifications in column 5 of Table 3 indicate that a greater refugee inflow is significantly associated with a higher share of top-earning occupations – mostly professionals and executive managers – in 1991. This finding suggests that refugee settlement localities not only have a larger non-primary sector, but also higher-paid and higher-productive occupations within the non-agricultural sector.

5.4 Effects on education

Finally, Table 4 presents alternative measures of current economic development as outcome variables: the average educational level in the 1971 and 1991 population. We examine the educational completion rate of the 20-50 years old population in order to focus on individuals, who were all at primary school age after the arrival of refugees. Again, the fact that these individuals are born after the inflow of refugees and thus are not refugees themselves rules out any mechanical composition effect. Estimates from different empirical specifications consistently suggest that a higher share of refugees is associated with a higher completion rate of primary, secondary, and tertiary education in 1971 and 1991. We find the most robust and sizable effects for secondary education completion rates in 1971 (column 2): the coefficient panel B implies that a one-standard-deviation increase in the log share of refugees translates into an increase by 1.7 points in the secondary school completion rate, which equals a 25% increase with respect to the average in low-refugee municipalities (7%).

Unfortunately, we are not able to observe the education of second-generation refugees and descendants of Greek natives, as neither of the 1971 and 1991 censuses provides information on birthplace. Nonetheless, the effects identified in Table 4 are unlikely to be driven by a composition effect. Figure A.4 in Appendix shows that refugees were on average *less* literate than natives upon arrival. Moreover, using survey data on second-generation refugees in the next section, we do not find any evidence of higher upward educational mobility among refugee families compared to native families: sons of refugees have similar educational level

to sons of Greek natives in the 2000s.

5.5 Comparison of the Size of the Estimated Effects

In order to compare the size of the estimated effects across specifications and outcomes, we define a treatment that takes the value of one if the number of refugees is more than 5% of the 1920 population in a given province for the specification (1) and in a given municipality for the specification (2) and normalize the outcome variables such that point estimates represent standardized effects of different treatments.

Figure 2 presents the standardized treatment effects. The size of the estimates consistently decreases as we move from province-level estimates to municipality-level estimates. This can be explained by either the fact that dichotomous treatment variable compares spatial units that are farther apart from one another in the province setting compared to the municipality setting, or by the presence of a greater unobserved heterogeneity across provinces than across nearby municipalities. Similarly, the size of the estimates consistently decreases as we move from municipality-level estimates with province fixed effects to municipality-level estimates with spatial and propensity score matching. This suggests that the latter estimation strategy might be taking into account the unobserved heterogeneities even across nearby municipalities better compared to the former one.

For a given estimation strategy, the size of the standardized treatment is rather stable across outcomes. The size of the province-level estimates vary between 0.4 to 0.7 standardized deviation of the outcome. The size of the municipality-level estimates vary between 0.2 to 0.4 standardized deviation of the outcome with province level fixed effects and between 0.15 to 0.3 with spatial and propensity score matching.

6 Mechanisms

We now turn to investigating the potential mechanisms underlying the persistent effects of refugees on today's prosperity. We first provide evidence in favor of three main channels of persistence: agglomeration economies, occupational specialization, and the introduction of new know-how brought by the refugees. We then test and find no supporting evidence in favor of alternative mechanisms that could account for our findings: the economic legacy of Muslims Turks, the land redistribution reform and the infrastructure investments, and the

upward mobility of second-generation refugees.

6.1 Agglomeration Economies

The mass inflow of more than one million refugees primarily resulted into a formidable population increase in Greece. Agglomeration economies provides an appealing theory as to how such a shock may have persistent beneficial consequences for industrialization and prosperity in settlement localities, by permanently shifting the distribution of economic activity from one equilibrium to another. The increasing returns to scale that this theory posits implies that productivity increases with the size of the manufacturing sector, which gives rise to multiple unstable equilibria. By providing a large supply of labor and an ample market demand for goods and services, the inflow of refugees may foster the expansion of the manufacturing sector (or its emergence) and lead to an increase in productivity and wages in places of resettlement. In response to the rise in local industrial wages, native Greeks may internally migrate to settlement localities and in turn contribute to a further productivity increase in that sector until wages equalize across the primary and non-primary sectors across localities. Therefore, the initial shock of the refugee inflow may unleash self-reinforcing agglomeration effects leading to the emergence of manufacturing centers at the places of settlement and to possibly more agricultural villages at the periphery.

Internal Migration in Resettlement Localities

If agglomeration economies operate, we should expect settlement localities to become poles of attraction for migrants from other localities in Greece. A testable implication is that, following the refugee inflow, we should observe a higher population growth in resettlement localities due to higher internal migration within Greece. Table 5 shows indeed that the resettlement of refugees is significantly associated with a higher population growth over both the 1928–1971 and 1928–1991 periods. We next examine internal migration patterns following the resettlement by drawing on birthplace data at the municipality level from the 2001 census, which allows us to compute migration rates of cohorts born after 1940 (and older than 18). Estimates in the third and fourth columns of Table 5 indicate that a higher share of refugees in a locality is significantly correlated with a subsequent lower out-migration from that locality and a higher in-migration in that locality, which thus translates into a

higher net-migration rate.[25]

Spillover Effects on Nearby Localities

Another effect of agglomeration economies is the reallocation of economic activity across localities, with places of settlement specializing in manufacturing and nearby localities (with less refugees) specializing relatively more in agricultural production. To assess the importance of such reallocation effects, we test whether being close settlement localities resulted into a larger agricultural sector today. We would expect such a relationship if the refugee inflow led to sectoral economic specialization across localities.

Following the approach of Sequeira, Nunn and Qian (2017), we compute the average share of refugees in all contiguous neighboring municipalities, where we weight each neighboring municipality in proportion to its 1920 population. We then re-estimate a version of equation (2) that also includes the weighted average share of refugees in contiguous municipalities. Because we do not know the particular form of spillovers, we also examine the effects of the refugee inflow in a locality's second neighbors, i.e., all neighbors of the first contiguous neighbors.

Table 6 reports the estimated spillover effects. Panel A reports the spillover effects on first contiguous neighbors and Panel B on both first and second neighbors. While in places of settlement the refugee inflow shifted the labor force away from agriculture into non-agriculture, it had the opposite effects in neighboring localities. Being next to settlement localities with more refugees is associated with a higher participation rate in agriculture and a lower participation rate in non-agricultural sector. The efffects are more precisely estimated in Panel B, when the spillover effects of both first and second neighbors are examined jointly. Overall, the evidence suggests that the refugee inflow fostered sectoral specialization across space.

Are the beneficial development effects of the refugee inflow *only* due to the reallocation of economic prosperity and not the creation of long-term growth? Do previous estimates in section 4 *only* reflect reallocation of economic activity and not higher growth? To answer to this question, we examine the spillover effects of the refugee inflow on the local development

[25]It is worth mentioning that net-migration rate is on average largely negative (-30%) because the sample consists only of 1928 rural municipalities (and excludes 1928 cities) and because most of the Greek rural population migrated to the big cities during the second half of the century. Seemingly, the effects of the rural resettlement were only able to mitigate this tendency of rural depopulation but not to offset it.

of neighboring localities.

Table 7 reports the estimates of the effects on either first neighbors (Panel A) and jointly on first and second neighbors (Panel B). We find that being close to a place of settlement (with higher share of refugees) is correlated with a lower population density in 1971 and 1991, which is consistent with evidence of higher internal in-migration in settlement localities during the decades following the arrival of refugees (see Table 5). However, we find evidence of *positive* spillover effects on night light luminosity, share of dwelling with electricity, share of dwelling with sewage inside (only in Panel B) and with tap water inside (only in Panel A). Remarkably, the spillover effects on luminosity and electricity are very similar in magnitude to the direct effects of the refuge inflow in places of settlement.[26] Overall, we find no evidence that refugee inflow into a locality resulted in a decline in long-run prosperity in nearby localities. In fact, if anything, spillovers appear to be positive although the precision of the spillover effects varies.

6.2 Occupational Specialization of Natives and Refugees

Peri (2012) finds that the productivity gains brought by immigration in the U.S. (measured by higher growth in total factor productivity) during the second-half of the 20th century were, at least in part, driven by an efficient specialization of immigrants and natives in tasks in which they have a comparative advantage, i.e., manual-intensive ones for immigrants and communication-intensive ones for natives. Such specialization is likely to have prevailed in Greece. When refugees arrived in Greece, they were on average less literate than natives and more likely to be farmers (in 1928 the employment share in agriculture was 85% among refugees versus 77% among natives). Moreover, refugees from the Cappadocia and Pontus regions had imperfect language skills in Greek, which might have given the natives a comparative advantage in communication non-manual intensive tasks. If so, the question as to whether the refugee inflow led natives to reallocate their labor towards non-agricultural occupation arises. Was there a native occupational upgrading similar to what happened in the U.S. (Peri and Sparber, 2009)?

We investigate how the refugee inflow affected natives' occupational choice in the short-

[26]Note that night light data is precise at 30 by 30 arc seconds and the size of the pixels is less than 1 square kilometer. (97.5% of the municipalities have more than 5 pixels that entirely fall within their borders). This high degree of precision addresses the concern that night light luminosity is mechanically correlated across contiguous municipalities.

term. We estimate the following difference-in-difference regression, exploiting the variation in the refugee inflow between 1920 and 1928 across provinces:

$$Y_{pt} = \alpha + \beta REF_{pt} + GEO_p * \delta_t + \delta_t + \delta_p + \epsilon_{pt} \tag{4}$$

where δ_t and δ_p are year and province fixed effects (with $t = 1920, 1928$). Geographical characteristics interacted with year fixed effects are included in the controls. REF_{pt} is the share of refugees in year t, equal to zero in 1920. Y_{pt} is the natives' labor force participation rate among the male population aged 10 or more. While occupational data for the native population is readily available in the 1928 census, the 1920 census provides data only for the overall population and not for natives and Turks separately. As Turks living in Greece probably worked in different occupations than native Greeks in 1920 (according to some fragmentary historical records), their expulsion from Greece is likely to have modified the average employment pattern of the population by 1925. Due to this compositional effect and to the spatial correlation between the refugee inflow and the Turk outflow, estimates of β may be biased. To address this problem, we exclude provinces in which the share of Turks was higher than 0.1% in the 1920 population.

Table 8 reports the estimates among all provinces in Panel A and among the sub-sample of provinces with less than 0.1% Turks in 1920. Both Panel suggest that the inflow of refugees significantly increases natives' participation in non-agricultural occupations while decreasing their work in agricultural occupations. The estimate of column (3) in Panel B suggest that a 10 point increase in the refugee share is associated with a 4.2 point increase in the natives' employment share of non-agricultural occupations. Overall, the results point to a specialization of refugees and natives in occupations in which they have a comparative advantage in, i.e., agriculture for refugees and non-agriculture for natives.

6.3 Persistence of New Industries Brought by Refugees

Although many of the refugees were low-skilled farmers, their inflow also resulted in an increase in the supply of more skilled workers who played a major role in the development of new industries that did not exist previously in Greece. A smaller number of refugees brought with them new knowledge and know-how, most notably in the textile industry – introducing silk and woolen materials and carpet production – as well as in the field of the tobacco production. We investigate whether such new industries have persisted in

settlement localities, thereby contributing to long-term growth possibly through trade and positive spillovers along the production chain, both upstream and downstream.

Drawing on employment data by 3-digit industry categories from the 1991 census, we examine the spatial distribution of the employment share of the textile industry and of the tobacco industry.[27] Table 9 presents evidence in favor of the persistence of these two types of industries that refugees brought (or greatly contributed to) in the 1920s. No matter the specification, all estimates indicate that the the size of the textile sector is significantly larger today in former settlement localities. Panel B estimate implies that one-standard-deviation increase in the share of refugees translates into a increase of 0.4 points in the employment share of the textile sector, which amounts to a 40% increase relative to the average in low-refuge localities. Although less robust, estimates of the correlation between refugee presence and the size of the tobacco industry also points to a form of persistence: in settlement localities a higher share of workers work in the tobacco industry.

6.4 Economic Legacy of Muslim Turkish Minority

Greek refugees largely settled in land and villages formerly occupied by Muslim Turkish minorities who were *all* forcibly removed from Greece in 1923. Virtually no Muslim Turkish communities (nor Bulgars) remained in Greece, except for Thrace which was exempted from the population exchange. Due to the full replacement of former Muslim minorities by refugee communities, the inflow of refugees and the outflow of Muslim Turks are very correlated across localities. Hence, the question as to whether the previous reduced-form estimates capture the economic legacy of the former presence of Muslim minorities rather than the true effect of the refugees arises.

We tackle this issue in three ways. First, we exploit province-level data on the number of Turks (and Bulgars) living in Greece in 1920 before the population exchange, we refine regression (1) by adding to the controls the share of Turks in the 1920 province population. Table 10 shows that, when we include the share of Turks as a control, the effects of the refugee inflow remain very significant across all outcomes and their size are in fact very similar to the estimates obtained without controlling for the share of Turks.

Second, we use the Ethnographic Map from Güvenc (2010) providing the ethnic composi-

[27] Textile includes leather, fur and footwear. Tobacco industry includes the manufacturing of tobacco products but exclude the cultivation of the crop.

tion of the 1915 population (Greeks, Turks, or Bulgars) in all municipalities of the Macedonia region and in some of Thessaly region. We construct a binary variable *Mostly Muslim in 1915* taking one when the majority of the the municipal population was Turkish. For municipalities that are not covered by the map, we either code the variable as missing or we code it as zero when the share of Turks in the 1920 province population is below 0.1%. Table 11 reports the estimates of a refined version of regression (2) at the municipality level, including the variable *Mostly Muslim in 1915* in addition to province fixed-effects and geographical controls. As the comparison of Panel A and B shows, we obtain estimates of the refugee inflow impacts that are very significant across all outcomes and very similar in magnitude to those obtained without controlling for the presence of Turks. Table 11 also reveals that, in the 1970s and 1990s, former Turkish villages have significantly lower population density, luminosity, and household wealth, are less industrialized and educated, and have lower earnings compared to other villages. The former presence of Turks seems therefore associated with lower economic development today, which is the opposite effect of the refugee inflow.

Third, we leverage our knowledge of the distribution of Muslims minorities across provinces to restrict the analysis to the "Old Greece" territory, in which no Muslim Turks were living before the population exchange. Old Greece is made of the three regions of Euboea, Peloponnese, and Central Greece, which were no longer under Ottoman rule in 1832, and therefore were not populated by Muslims. Table 12 presents estimates of regression (2) among the sample of municipalities of the "Old Greece" territory. Estimates remain very significant and indicate that the refugee inflow had a very beneficial effect on long-term prosperity within the "Old Greece" territory. These estimates are also similar in magnitude to those obtained in the entire sample of Greek municipalities, thereby suggesting that the impact of refugees is not entirely shaped by the advantageous possibility to seize abandoned properties and cultivate the fertile land left behind by the Turks.

6.5 Land Redistribution and Infrastructure Investment

One of the resettlement policies undertook by the RSC was the redistribution of large estates into smallholdings (see section 2). Considering the large literature of the long-term effects of land redistribution of any types, it seems natural to ask whether this radical land reform had persistent impact per se on settlement localities. While we are unable to fully address the question due to the lack of reliable cadastral data, we still can offer some evidence as

to whether the higher current prosperity of settlement localities is entirely driven by the land reform they underwent at the end of 1920s. Because the reform mostly consisted in fractioning and redistributing the large tracts of arable land owned by the Muslim Turks (the chiftliks estates), regions of Greece where no Turks lived were almost unaffected by this reform. Therefore, the fact that, in Table 12, estimates of the refugees' impacts remain unchanged when restricting to the "Old Greece" municipalities is a good indication that the land reform cannot fully account for the positive correlation between refugee inflow and today's local prosperity.

Another question relates to the drainage and other infrastructure works (e.g., roads, bridges, dispensaries) that the RSC undertook. Do such growth-enhancing investments in resettlement localities contribute to explain our findings? All historical records, from the RSC archives or or from Greek historians, suggest that these infrastructure works were mostly carried out in the Northern provinces of Greece. D. Pentzopoulos, one of the most cited historian of the period, putting together RSC's archives, reaches the conclusion that less than 15% of all funds for the agricultural settlements were spent in the "Old Greece" provinces (Pentzopoulos, 1962, p. 111). Given the positive effects of refugees on long-run prosperity in Old Greece (Table 12), this historical account provides suggestive evidence that the positive relationship we uncover between refugee inflow and economic development is unlikely to be entirely driven by these infrastructure works.

6.6 Second-Generation Refugees

We examine whether the findings that settlement localities are richer, more educated, and less agricultural today is driven by the economic success of refugee families and their descendants. The 1928 census reveals that, upon arrival, the refugees were on average less literate and more likely to be farmers relative the native population. It is yet possible that, due to differential intergenerational mobility, second-generation refugees not only converged towards but also leapfrogged Greek natives' children. Are second-generation refugees more economically successful than Greek natives' sons?

We address this question by using the European Social Survey (ESS) which provides data on parents' birthplace for each respondent. We identify second-generation refugees as individuals born in Greece with at least one parent born in Turkey. We focus on cohorts born between 1923 and 1953. Given our focus on the refugee effects on rural localities in

the main analysis, we further exclude individuals living in big cities, such as Athens and Thessaloniki. Among the final sample of 1715 male respondents born in Greece between 1923 and 1953, we find that 11.6% have parents born in Turkey.

Table 13 presents the mean differences in educational attainment and last (or current) occupation between individuals whose parents were born in Turkey and those whose parents were born in Greece. Irrespective of which controls are included in the regression, we find neither sizable, nor statistically significant difference between second-generation refugees and sons of natives in terms of primary school completion and junior high school completion. We find no significant differences in whether the last occupation was in the agricultural or non-agricultural sector either. Last column of Table 13 suggest that, if anything, second-generation refugees were less likely to hold high-skilled professions in the non-primary sector relative to sons of natives. Our previous findings showing that places of settlements have a higher share of high-skilled occupations in 1971 or 1991 (Table 3) cannot therefore be accounted for by a mechanical composition effect generated by the second-generation refugees. Taken as a whole, Table 13 provides evidence that second-generation refugees are similar to sons of Greeks natives in terms of human capital (education and profession), which suggests to rule out the possibility that a simple composition effect drives the growth-enhancing effect of refugee inflow.

7 Conclusion

We examined the long-term impact of the mass refugee inflow into Greece in the 1920s on contemporary economic prosperity. To address the concerns of endogenous self-selection of refugees into places of settlement, we began by documenting that rural localities that received refugees had very similar initial level of development relative to other localities conditional on geographical features. We then implemented a series of empirical strategies relying on different margin of spatial variation of the refugee inflow: across provinces, across municipalities within the same province, and finally between municipalities spatially contiguous sharing identical geographical features. Despite the difference in identifying assumptions, all three estimation frameworks produced similar results.

We found that localities that received more refugees in 1923 have higher earnings, higher levels of household wealth, greater educational attainment, as well as a larger financial and

manufacturing sector today. The magnitudes of our estimates are not only statistically significant but also economically meaningful. Our municipal-level estimates suggest that a one-standard-deviation increase in the share of refugees translates into a 25% larger non-primary sector among the employed, relative to the low-refugee localities' average. The resettlement of refugees contributed significantly to the process of structural transformation away from agriculture that the Greek economy experienced during the second half of the twentieth century.

We then explored the mechanisms that generated the identified long-term benefits. We presented evidence that, by providing a large workforce, refugees generated agglomerations economies which transformed settlement localities in local manufacturing centers attracting native workers from other parts of Greece, by increasing productivity and wages. Some refugees also brought with them new knowledge and know-how, most notably in the textile industry – introducing silk and woolen materials and carpet-making – as well as in the tobacco production. We showed that these two industries, newly introduced by refugees in the 1920s, persistently account for a larger employment share in settlement localities still today, thereby contributing to long-term growth possibly through trade and positive spillovers along the production chain.

Greece was on the eve of industrialization in the 1920s and the large increase in workforce generated by the resettlement together with the new industrial know-hows that some refugee brought may have revealed particularly valuable in the critical period of economic development. Despite the unique context in which this mass refugee inflow took place, we believe our findings may still be informative for current debates, particularly when assessing under which conditions immigrants and displaced refugees could have beneficial long-run impacts on economic growth. Our findings shed indeed some light on the effectiveness refugee resettlement policies in a context of a relatively poor agrarian economy, similar to contemporary Sub-Saharan Africa that currently hosts the largest number of forcibly displaced people. Although we cannot provide direct evidence for it, at least three features of the settlement policy has a potential to have played a major role in shaping the beneficial effects that Greek refugees had on the localities in which they settled: (i) refugee households were given houses, arable land, livestock, seeds and agricultural tools to live, work and maintain themselves; (ii) there were a conscious effort to maintain the same homogenous communities of origin, as opposed to resettle refugees as individuals; (iii) all refugees were granted the Greek citizenship

immediately upon arrival, which certainly facilitates their social and political integration.

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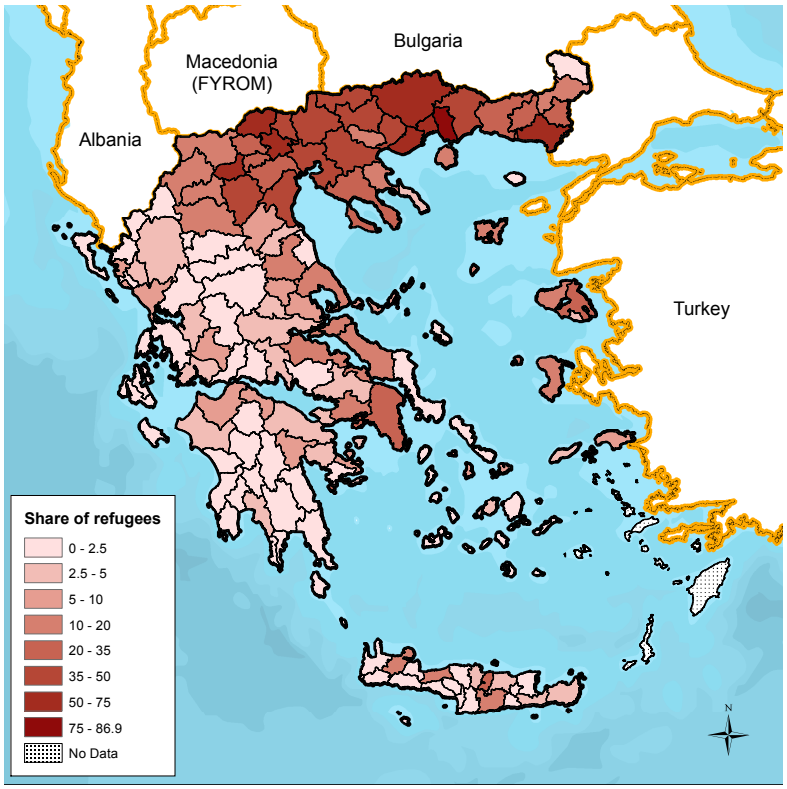
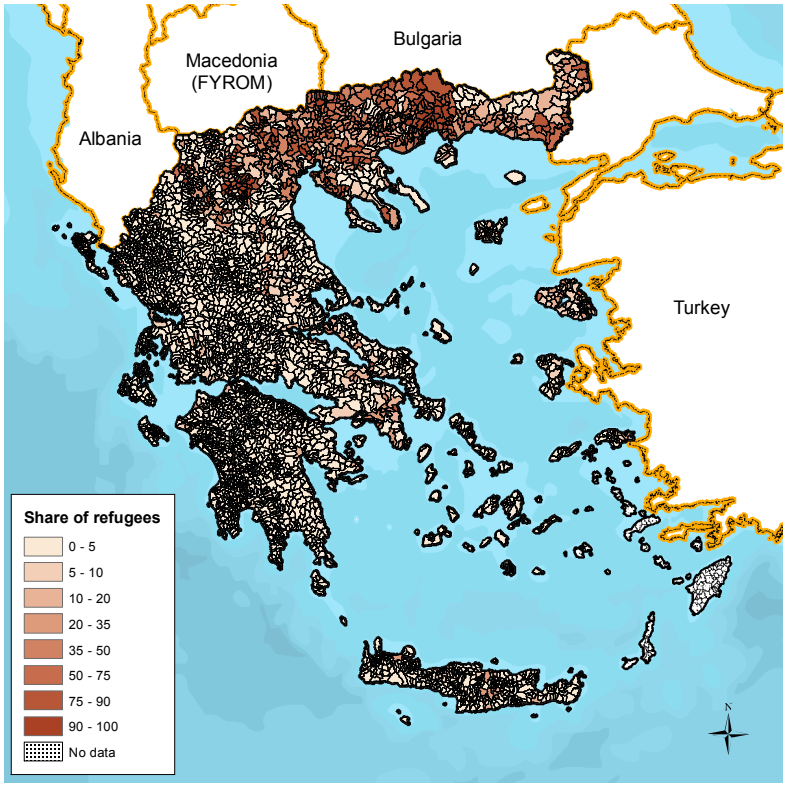
Figure 1: Distribution of Refugees across Greece in 1928

(a) Share of refugees in 1928 at the province level



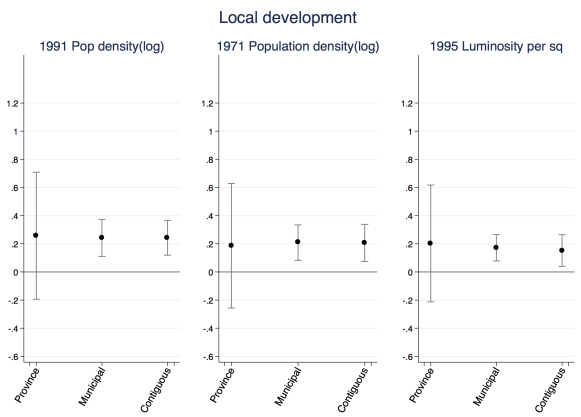
(b) Share of refugees in 1928 at the municipality level



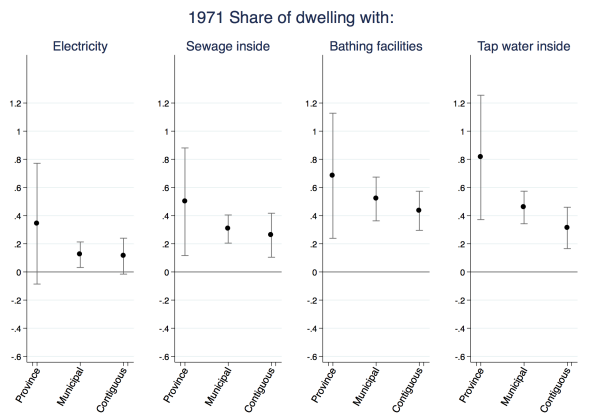
Notes: Data come from the 1928 census of the Kingdom of Greece. The darker the red color, the higher the share of refugees relative to the 1928 population

Figure 2: Standarized Treatment effects

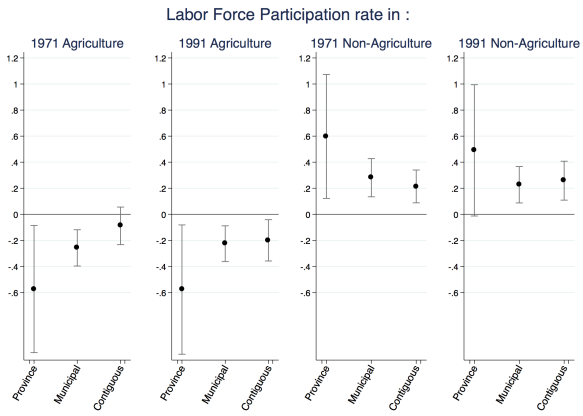
(a) Population Density and Luminosity



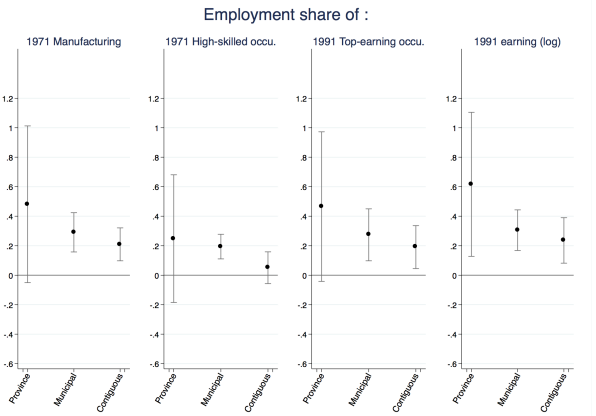
(b) Dwelling wealth



(c) Sectoral transformation



(d) Non-primary occupations and earnings



Notes: This figure presents the point estimates and standard errors at 95% obtained from OLS estimates. It reports the effects of standardized treatment defined as having a number of refugees more than 5% of the 1920 population in a given province or municipality. The outcomes are normalized such that the size of the point estimates reflect effects in terms of standardized devation of the outcome variable. "Province" in the x-axis stands for province-level estimates obtained from specification 1 using the standardized treatment. "Municipal" in the x-axis stands for municipality-level estimates obtained from specification 2 using the standardized treatment, and "Contigous" stands for municipality-level estimates obtained from spatial and propensity score matching.

Table 1: Effects of refugees on local development

Dependent variable:	Population density (log)		Luminosity per sqkm	Share of dwellings in 1971 with			
	1971	1991	in 1995 (log)	Electricity	Sewage inside	Bathing facilities inside	Tap water inside
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A - Regression at the province level							
Share of refugees in 1928 (log)	0.021	0.039	0.066	3.093***	3.065***	1.331***	4.042***
	(0.026)	(0.030)	(0.057)	(0.679)	(0.622)	(0.335)	(0.752)
N	138	138	138	138	138	138	138
Panel B - Regression at the municipality level with province fixed-effects							
Share of refugees in 1928 (log)	0.065***	0.076***	0.087***	1.657***	1.994***	1.232***	3.138***
	(0.012)	(0.013)	(0.014)	(0.335)	(0.255)	(0.146)	(0.283)
N	4,184	4,202	4,204	4,184	4,184	4,184	4,184
Average in low-refugees localities	3.1	3.03	.54	50.01	62.92	2.52	14.2
Panel C - Spatial matching estimator: contiguous municipalities and propensity score							
Treated (>5% sh.refugees)	0.190***	0.247***	0.202***	2.700*	4.530***	3.698***	7.556***
	(0.062)	(0.064)	(0.076)	(1.568)	(1.387)	(0.604)	(1.812)
N	744	744	745	744	744	744	744
Average untreated	3.32	3.286	1.322	68.114	74.033	4.786	25.538

Note: Unit of analysis is province in Panel A and municipality in Panels B and C. Cities according to the 1928 statistical definition, as well as provinces of Athens and Month Athos, are excluded from the sample. Panel C reports matching estimator which, for each treated municipality, constructs the counterfactual outcome as an average of the spatially contiguous untreated municipalities. For each treated municipality, the control group is constructed by picking the contiguous untreated neighbors that have the most similar geographical characteristics using propensity score matching. We exclude 20% of the treated-control matches that are too dissimilar in terms of propensity score based on geography. Geographical characteristics used for the propensity score computation in Panel C and included as control in Panels A and B are the following: distance to railway network in 1920 (km); distance to rivers (km); mean altitude (m); mean annual precipitation in the period 1960–1990 (mm); mean annual temperature in the period 1960–1990 (degrees); number of frost free days; length of the growing period; suitability index of crops. Conley standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

Table 2: Effects of refugees on sectoral transformation of the labor market

	Labor force participation in			
	Agriculture		Non-agriculture	
Dependent variable:	1971	1991	1971	1991
	(1)	(2)	(3)	(4)
Panel A - Regression at the province level				
Share of refugees in 1928 (log)	-2.617***	-1.554**	1.092**	0.995*
	(0.896)	(0.640)	(0.428)	(0.555)
N	138	138	138	138
Panel B - Regression at the municipality level with province fixed-effects				
Share of refugees in 1928 (log)	-2.186***	-1.045***	1.156***	0.718***
	(0.349)	(0.209)	(0.205)	(0.174)
N	4,171	4,202	4,171	4,202
Average in low-refugees localities	52.34	26.75	14.21	31.98
Panel C - Spatial matching estimator: contiguous municipalities and propensity score				
Treated (Share of refugees >5%)	-1.918	-3.295**	2.554***	3.099***
	(1.598)	(1.334)	(0.766)	(0.914)
N	744	744	744	744
Average untreated	46.509	28.151	16.541	29.921

Note: Unit of analysis is province in Panel A and municipality in Panels B and C. Cities according to the 1928 statistical definition, as well as provinces of Athens and Month Athos, are excluded from the sample. Panel C reports matching estimator which, for each treated municipality, constructs the counterfactual outcome as an average of the spatially contiguous untreated municipalities. For each treated municipality, the control group is constructed by picking the contiguous untreated neighbors that have the most similar geographical characteristics using propensity score matching. We exclude 20% of the treated-control matches that are too dissimilar in terms of propensity score based on geography. Geographical characteristics used for the propensity score computation in Panel C and included as control in Panels A and B are the following: distance to railway network in 1920 (km); distance to rivers (km); mean altitude (m); mean annual precipitation in the period 1960–1990 (mm); mean annual temperature in the period 1960–1990 (degrees); number of frost free days; length of the growing period; suitability index of crops. Conley standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Effects of refugees on non-primary occupations and earnings

Dependent variable:	Share of				Share of
	Financial sector in 1971	Manufacturing in 1971	High-skilled occupation in 1971	Earnings (log) in 1991	Top earning occupations in 1991
	(1)	(2)	(3)	(4)	(5)
Panel A - Regression at the province level					
Share of refugees in 1928 (log)	0.050	0.750**	0.203*	0.010**	0.326**
	(0.031)	(0.353)	(0.108)	(0.004)	(0.134)
N	138	138	138	138	138
Panel B - Regression at the municipality level with province fixed-effects					
Share of refugees in 1928 (log)	0.077***	0.571***	0.313***	0.009***	0.419***
	(0.027)	(0.075)	(0.058)	(0.001)	(0.083)
N	4,162	4,162	4,162	4,196	4,196
Average in low-refugees localities	.2	3.65	3.54	6.39	3.98
Panel C - Spatial matching estimator: contiguous municipalities and propensity score					
Treated (>5% sh.refugees)	0.182**	1.829***	0.287	0.021***	0.917**
	(0.083)	(0.498)	(0.311)	(0.007)	(0.358)
N	744	744	744	744	744
Average untreated	.31	6.591	3.135	6.405	4.684

Note: Unit of analysis is province in Panel A and municipality in Panels B and C. Cities according to the 1928 statistical definition, as well as provinces of Athens and Month Athos, are excluded from the sample. Panel C reports matching estimator which, for each treated municipality, constructs the counterfactual outcome as an average of the spatially contiguous untreated municipalities. For each treated municipality, the control group is constructed by picking the contiguous untreated neighbors that have the most similar geographical characteristics using propensity score matching. We exclude 20% of the treated-control matches that are too dissimilar in terms of propensity score based on geography. Geographical characteristics used for the propensity score computation in Panel C and included as control in Panels A and B are the following: distance to railway network in 1920 (km); distance to rivers (km); mean altitude (m); mean annual precipitation in the period 1960–1990 (mm); mean annual temperature in the period 1960–1990 (degrees); number of frost free days; length of the growing period; suitability index of crops. Conley standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Effects of refugees on human capital investment

Dependent variable:	Completion rate of			
	Primary edu. in 1971	Secondary edu. in 1971	Secondary edu. in 1991	Tertiary edu. in 1991
	(1)	(2)	(3)	(4)
Panel A - Regression at the province level				
Share of refugees in 1928 (log)	0.825*	0.530**	0.071	0.017
	(0.494)	(0.256)	(0.399)	(0.169)
N	138	138	138	138
Panel B - Regression at the municipality level with province fixed-effects				
log sh. refugees 1920	0.884***	0.854***	0.958***	0.326***
	(0.161)	(0.122)	(0.190)	(0.102)
N	4,171	4,171	4,202	4,202
Average in low-refugees localities	58.35	7.01	22.34	6.84
Panel C - Spatial matching estimator: contiguous municipalities and propensity score				
Treated (>5% sh.refugees)	0.455	1.653***	1.962**	0.607
	(1.051)	(0.432)	(0.804)	(0.463)
N	744	744	744	744
Average untreated	59.945	7.2	21.034	7.231

Note: Unit of analysis is province in Panel A and municipality in Panels B and C. Cities according to the 1928 statistical definition, as well as provinces of Athens and Month Athos, are excluded from the sample. Panel C reports matching estimator which, for each treated municipality, constructs the counterfactual outcome as an average of the spatially contiguous untreated municipalities. For each treated municipality, the control group is constructed by picking the contiguous untreated neighbors that have the most similar geographical characteristics using propensity score matching. We exclude 20% of the treated-control matches that are too dissimilar in terms of propensity score based on geography. Geographical characteristics used for the propensity score computation in Panel C and included as control in Panels A and B are the following: distance to railway network in 1920 (km); distance to rivers (km); mean altitude (m); mean annual precipitation in the period 1960–1990 (mm); mean annual temperature in the period 1960–1990 (degrees); number of frost free days; length of the growing period; suitability index of crops. Conley standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Mechanism: Agglomeration effects

Dependent variable:	Population growth		Internal migration rate (1940–2001)		
	1928-1971	1928-1991	Out-migration	In-migration	Net migration
	(1)	(2)	(3)	(4)	(5)
Panel A - Regression at the province level					
Share of refugees in 1928 (log)	2.610	5.171**	-0.019**	0.010*	0.027***
	(1.734)	(2.550)	(0.007)	(0.005)	(0.009)
N	138	138	813	813	813
Panel B - Regression at the municipality level with province fixed-effects					
Share of refugees in 1928 (log)	1.610***	3.820***	-0.006**	0.013***	0.018***
	(0.422)	(0.564)	(0.003)	(0.003)	(0.004)
N	4,160	4,165	813	813	813
Average in low-refugees localities	-20.11	-23.21	.6	.2	-.4

Note: Unit of analysis is province in Panel A and municipality in Panel B. Cities according to the 1928 statistical definition, as well as provinces of Athens and Month Athos, are excluded from the sample. Internal migration is computed for a sample of individuals aged between 18 and 60 using information on birth place and place of residence from 2001 census. Geographical characteristics included as control in Panels A and B are the following: distance to railway network in 1920 (km); distance to rivers (km); mean altitude (m); mean annual precipitation in the period 1960–1990 (mm); mean annual temperature in the period 1960–1990 (degrees); number of frost free days; length of the growing period; suitability index of crops. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Mechanism: Agglomeration economies and sectoral specialization of neighbouring municipalities

Dependent variable:	Labor force participation in			
	Agriculture		Non-agriculture	
	1971	1991	1971	1991
	(1)	(2)	(3)	(4)
Panel A - Spillover on Contiguous Neighbors				
Share of refugees in 1928 (log)	-2.092***	-1.063***	1.145***	0.752***
	(0.342)	(0.199)	(0.201)	(0.169)
Average share of refugees among contiguous neighbors (log)	-0.288	0.295	-0.139	-0.420***
	(0.294)	(0.199)	(0.164)	(0.137)
N	4,147	4,178	4,147	4,178
Panel B - Spillover on First and Second Contiguous Neighbors				
Share of refugees in 1928 (log)	-2.128***	-1.059***	1.131***	0.708***
	(0.349)	(0.207)	(0.207)	(0.172)
Average share of refugees among first and second neighbors (log)	0.202	0.712***	-0.366**	-0.481**
	(0.343)	(0.266)	(0.171)	(0.194)
N	4,132	4,163	4,132	4,163
average in places with few refugees	52.32	26.75	14.22	31.99
municipality level and prov FE	X	X	X	X

Note: Unit of analysis is the municipality. Province fixed effects and Geographical characteristics included as control. Dependent variables are computed for a sample of individuals aged between 20 and 50. The average share of refugees among contiguous neighbors is computed as the ratio of the total refugee population in all contiguous municipalities divided by the total population in 1920. The same applies for first and second contiguous neighbors. Cities according to the 1928 statistical definition, as well as provinces of Athens and Month Athos, are excluded from the sample. *** p<0.01, ** p<0.05, * p<0.1 *** p<0.01, ** p<0.05, * p<0.1

Table 7: Reallocation versus creation of long-run prosperity : Spillover effects on local development of neighbouring municipalities

Dependent variable:	Population density (log)		Luminosity per sqkm	Share of dwellings in 1971 with			
	1971	1991	in 1995 (log)	Electricity	Sewage inside	Bathing facilities inside	Tap water inside
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A - Spillovers on Contiguous Neighbors							
Share of refugees in 1928 (log)	0.067***	0.078***	0.073***	1.427***	1.925***	1.212***	3.050***
	(0.011)	(0.013)	(0.013)	(0.315)	(0.256)	(0.142)	(0.280)
Average refugee share among contiguous neighbors (log)	-0.025**	-0.033***	0.067***	1.107***	0.434	0.062	0.520**
	(0.010)	(0.010)	(0.019)	(0.386)	(0.306)	(0.084)	(0.252)
N	4,160	4,178	4,180	4,160	4,160	4,160	4,160
Panel B - Spillover on First and Second Contiguous Neighbors							
Share of refugees in 1928 (log)	0.065***	0.076***	0.077***	1.463***	1.915***	1.205***	3.103***
	(0.012)	(0.013)	(0.014)	(0.335)	(0.258)	(0.145)	(0.283)
Average refugee share among first and second neighbors (log)	-0.033**	-0.043***	0.079***	1.434***	1.218***	-0.016	0.184
	(0.017)	(0.014)	(0.028)	(0.506)	(0.350)	(0.116)	(0.358)
N	4,145	4,163	4,165	4,145	4,145	4,145	4,145
average in places with few refugees	3.1	3.03	.54	49.99	62.92	2.52	14.19
Province Fixed Effects	X	X	X	X	X	X	X

Note: Unit of analysis is the municipality. Province fixed effects and Geographical characteristics included as control. The average share of refugees among contiguous neighbors is computed as the ratio of the total refugee population in all contiguous municipalities divided by the total population in 1920. The same applies for first and second contiguous neighbors. Cities according to the 1928 statistical definition, as well as provinces of Athens and Month Athos, are excluded from the sample. *** p<0.01, ** p<0.05, * p<0.1 -

Table 8: Mechanism: efficiency gains from tasks specialization of natives and refugees (1928-1920)

Dependent variable :	Occupational choices of natives in 1928 and 1920 (among the male population aged 10 or more)		
Natives'	Labor Force Participation		Employment share
	Agriculture	Non-agriculture	Non-agriculture
	(1)	(2)	(3)
Panel A - Sample: all provinces			
Share of refugees in 1928	-0.174***	0.177***	0.209***
	(0.041)	(0.030)	(0.034)
N	274	274	274
Average	58.92	20.32	26.21
Panel B- Sample: provinces with no Turks in 1920			
Share of refugees in 1928	-0.572***	0.284*	0.424**
	(0.214)	(0.162)	(0.201)
N	146	146	146
Average	54.97	22.23	29.27
Province FE	X	X	X
Year FE	X	X	X
Year *times* Geographical controls	X	X	X

Note: The unit of analysis is province-year, either in the year 1928 or in 1920. The estimate of the coefficient β of the following difference-in-difference regression is reported :

$$Y_{pt} = \alpha + \beta REF_{pt} + GEO_p * \delta_t + \delta_t + \delta_p + \epsilon_{pt}$$

where δ_t and δ_p are year and province fixed effects. Geographical characteristics interacted with year fixed effects are included in the controls. Dependent variables are either labor force participation rate or employment share among the male population aged 10 or more. Heteroskedasticity-robust standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

Table 9: Mechanism: Persistence of new industries brought by refugees (1991)

Dependent variable:	Textile		Tobacco	
	Presence	Employment share	Presence	Employment share
	(1)	(2)	(3)	(4)
Panel A - Regression at the province level				
Share of refugees in 1928 (log)	0.006	0.791***	0.024	0.020
	(0.005)	(0.243)	(0.029)	(0.025)
N	138	138	138	138
Panel B - Regression at the municipality level with province fixed-effects				
Share of refugees in 1928 (log)	0.039***	0.205***	0.010***	0.006**
	(0.005)	(0.051)	(0.002)	(0.002)
N	4,196	4,194	4,196	4,194
Average in low-refugees localities	.39	1.09	.02	.03
Panel C - Spatial matching estimator: contiguous municipalities and propensity score				
Treated (Share of refugees >5%)	0.098***	1.200*	0.070***	-0.007
	(0.033)	(0.615)	(0.026)	(0.046)
N	741	740	741	740
Average untreated	.631	2.721	.048	.043

Note: Unit of analysis is province in Panel A and municipality in Panels B and C. Cities according to the 1928 statistical definition, as well as provinces of Athens and Month Athos, are excluded from the sample. Presence is a dummy variable that takes the value of one if the industry is present in the municipality. Employment share is the share of a given industry among the employed persons aged between 20 and 50. Panel C reports matching estimator which, for each treated municipality, constructs the counterfactual outcome as an average of the spatially contiguous untreated municipalities. The control group is constructed by picking, among a treated municipality's contiguous neighbors, the untreated ones that have the most similar geographical characteristics using propensity score matching. We exclude 20% of the treated-control matches that are too dissimilar in terms of propensity score based on geography. Geographical characteristics used for the propensity score computation in Panels C and included as control in Panels A, B, and C are the following: distance to railway network in 1920 (km); distance to rivers (km); mean altitude (m); mean annual precipitation in the period 1960–1990 (mm); mean annual temperature in the period 1960–1990 (degrees); number of frost free days; length of the growing period; suitability index of crops. Heteroskedasticity-robust standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

Table 10: Mechanism: Economic legacy of Muslim-Turkish minority at the province level

Dependent variable:	Population density (log)		Luminosity per sqkm	Share of dwellings in 1971 with			
	1971	1991	in 1995 (log)	Electricity	Sewage inside	Bathing facilities inside	Tap water inside
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Share of refugees in 1928 (log)	0.027	0.050	0.125*	2.719***	2.868***	1.734***	4.833***
	(0.032)	(0.037)	(0.071)	(0.840)	(0.770)	(0.410)	(0.925)
Share of Turks in 1920 (log)	-0.007	-0.011	-0.059	0.379	0.200	-0.409*	-0.804
	(0.019)	(0.022)	(0.042)	(0.501)	(0.459)	(0.245)	(0.551)
N	138	138	138	138	138	138	138

Dependent variable:	Completion rate of				Labor force participation in			
					Agriculture		Non-agriculture	
	Primary edu. in 1971	Secondary edu. in 1971	Secondary edu. in 1991	Tertiary edu. in 1991	in 1971	in 1991	in 1971	in 1991
	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Share of refugees in 1928 (log)	1.439**	0.808**	0.354	0.055	-3.741***	-1.712**	1.686***	0.725
	(0.605)	(0.314)	(0.492)	(0.210)	(1.098)	(0.793)	(0.523)	(0.687)
Share of Turks in 1920 (log)	-0.624*	-0.283	-0.287	-0.038	1.141*	0.161	-0.604*	0.274
	(0.361)	(0.187)	(0.293)	(0.125)	(0.654)	(0.473)	(0.312)	(0.409)
N	138	138	138	138	138	138	138	138

Dependent variable:	Share of				Share of
	Financial sector in 1971	Manufacturing in 1971	High-skilled occupation in 1971	Earnings (log) in 1991	Top earning occupations in 1991
	(16)	(17)	(18)	(19)	(20)
Share of refugees in 1928 (log) 1920	0.094**	1.157***	0.202	0.011**	0.333**
	(0.038)	(0.434)	(0.134)	(0.005)	(0.166)
Share of Turks in 1920 (log)	-0.045*	-0.414	0.001	-0.001	-0.007
	(0.023)	(0.258)	(0.080)	(0.003)	(0.099)
N	138	138	138	138	138

Note: Unit of analysis is province; cities according to the 1928 statistical definition are excluded. See Tables 1, 4, 2, 3 for the construction of dependent variables. Geographical characteristics included as control are the following: distance to railway network in 1920 (km); distance to rivers (km); mean altitude (m); mean annual precipitation in the period 1960–1990 (mm); mean annual temperature in the period 1960–1990 (degrees); number of frost free days; length of the growing period; suitability index of crops. Heteroskedasticity-robust standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

Table 11: Mechanism: Economic legacy of Muslim-Turkish minority at the municipality level (Ethnographic Map)

Dependent variable:	Population density (log) 1971	Population density (log) 1991	Luminosity per sqkm in 1995 (log)	Share of dwellings in 1971 with Electricity	Share of dwellings in 1971 with Sewage inside	Share of dwellings in 1971 with Bathing facilities inside	Share of dwellings in 1971 with Tap water inside
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A							
Share of refugees in 1928 (log)	0.058***	0.069***	0.083***	1.611***	1.860***	1.325***	3.414***
	(0.014)	(0.016)	(0.017)	(0.420)	(0.318)	(0.181)	(0.320)
N	3,060	3,071	3,073	3,060	3,060	3,060	3,060
Panel B							
Share of refugees in 1928 (log)	0.071***	0.083***	0.091***	1.861***	2.030***	1.437***	3.609***
	(0.013)	(0.015)	(0.017)	(0.388)	(0.293)	(0.171)	(0.317)
Mostly Muslim in 1915	-0.536***	-0.584***	-0.317***	-10.256***	-6.964***	-4.623***	-8.010***
	(0.088)	(0.097)	(0.087)	(2.394)	(1.788)	(0.788)	(2.634)
N	3,060	3,071	3,073	3,060	3,060	3,060	3,060

Dependent variable:	Completion rate of Primary edu. in 1971	Completion rate of Secondary edu. in 1971	Completion rate of Secondary edu. in 1991	Completion rate of Tertiary edu. in 1991	Labor force participation in Agriculture in 1971	Labor force participation in Agriculture in 1991	Labor force participation in Non-agriculture in 1971	Labor force participation in Non-agriculture in 1991
	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Panel A								
Share of refugees in 1928 (log)	0.974***	0.853***	1.060***	0.345***	-1.971***	-1.028***	1.212***	0.759***
	(0.183)	(0.152)	(0.237)	(0.128)	(0.430)	(0.251)	(0.266)	(0.207)
N	3,053	3,053	3,071	3,071	3,053	3,071	3,053	3,071
Panel B								
Share of refugees in 1928 (log)	0.980***	0.874***	1.157***	0.400***	-2.283***	-1.219***	1.351***	0.912***
	(0.196)	(0.156)	(0.228)	(0.120)	(0.383)	(0.245)	(0.246)	(0.193)
Mostly Muslim in 19151915	-0.249	-0.871	-4.016***	-2.251***	12.782***	7.898***	-5.724***	-6.326***
	(1.422)	(0.603)	(1.020)	(0.571)	(3.351)	(1.414)	(1.296)	(1.109)
N	3,053	3,053	3,071	3,071	3,053	3,071	3,053	3,071

Dependent variable:	Share of Financial sector in 1971	Share of Manufacturing in 1971	Share of High-skilled occupation in 1971	Earnings (log) in 1991	Share of Top earning occupations in 1991
	(16)	(17)	(18)	(19)	(20)
Panel A					
Share of refugees in 1928 (log)	0.081**	0.544***	0.313***	0.009***	0.433***
	(0.036)	(0.088)	(0.059)	(0.002)	(0.105)
N	3,048	3,048	3,048	3,067	3,067
Panel B					
Share of refugees in 1928 (log)	0.093***	0.639***	0.279***	0.011***	0.486***
	(0.034)	(0.086)	(0.067)	(0.002)	(0.099)
Mostly Muslim in 1915	-0.490***	-3.903***	1.407	-0.047***	-2.235***
	(0.152)	(0.874)	(0.920)	(0.007)	(0.429)
N	3,048	3,048	3,048	3,067	3,067

Note: Unit of analysis is municipality. *Mostly Muslim in 1915* is a binary taking one if the majority of the population was Muslim in 1915 . See the data section for details. Cities according to the 1928 statistical definition are excluded. See Tables 1, 4, 2, 3 for the construction of dependent variables. All reported regressions include as regressors province fixed-effects and geographical controls. Geographical characteristics included as control are the following: distance to railway network in 1920 (km); distance to rivers (km); mean altitude (m); mean annual precipitation in the period 1960–1990 (mm); mean annual temperature in the period 1960–1990 (degrees); number of frost free days; length of the growing period; suitability index of crops. Conley standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

Table 12: Mechanism: Land reform and Infrastructure Investments

The sample is restricted to regions of "Old Greece" (Euboea, Central Greece, Peloponnese)

Dependent variable:	Population density (log) 1971	Population density (log) 1991	Luminosity per sqkm in 1995 (log)	Share of dwellings in 1971 with: Electricity	Sewage inside	Bathing facilities inside	Tap water inside
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Share of refugees in 1928 (log)	0.114***	0.136***	0.138***	2.647***	2.983***	2.183***	4.363***
	(0.012)	(0.013)	(0.015)	(0.386)	(0.283)	(0.187)	(0.373)
N	2,085	2,091	2,091	2,085	2,085	2,085	2,085

Dependent variable:	Completion rate of: Primary edu. in 1971	Secondary edu. in 1971	Secondary edu. in 1991	Tertiary edu. in 1991	Labor force participation in: Agriculture in 1971	Agriculture in 1991	Non-agriculture in 1971	Non-agriculture in 1991
	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Share of refugees in 1928 (log)	1.219***	1.345***	1.611***	0.684***	-3.634***	-1.881***	2.408***	1.466***
	(0.242)	(0.169)	(0.172)	(0.079)	(0.352)	(0.236)	(0.208)	(0.176)
N	2,079	2,079	2,091	2,091	2,079	2,091	2,079	2,091

Dependent variable:	Share of: Financial sector in 1971	Manufacturing in 1971	High-skilled occupation in 1971	Earnings (log) in 1991	Share of: Top earning occupations in 1991
	(16)	(17)	(18)	(19)	(20)
Share of refugees in 1928 (log)	0.184***	0.859***	0.440***	0.016***	0.705***
	(0.033)	(0.131)	(0.093)	(0.001)	(0.079)
N	2,077	2,077	2,077	2,089	2,089

Note: Unit of analysis is municipality; cities according to the 1928 statistical definition are excluded. The sample is restricted to administrative regions of Greece of Euboea, Central Greece, and Peloponnese. No Turks were living there in 1920. See Tables 1, 4, 2, 3 for the construction of dependent variables. All reported regressions include as regressors province fixed-effects and geographical controls. Geographical characteristics included as control are the following: distance to railway network in 1920 (km); distance to rivers (km); mean altitude (m); mean annual precipitation in the period 1960–1990 (mm); mean annual temperature in the period 1960–1990 (degrees); number of frost free days; length of the growing period; suitability index of crops. Conley standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

Table 13: Mechanism: Second-generation refugees vs. natives (ESS: 1st, 2nd, and 4th rounds)

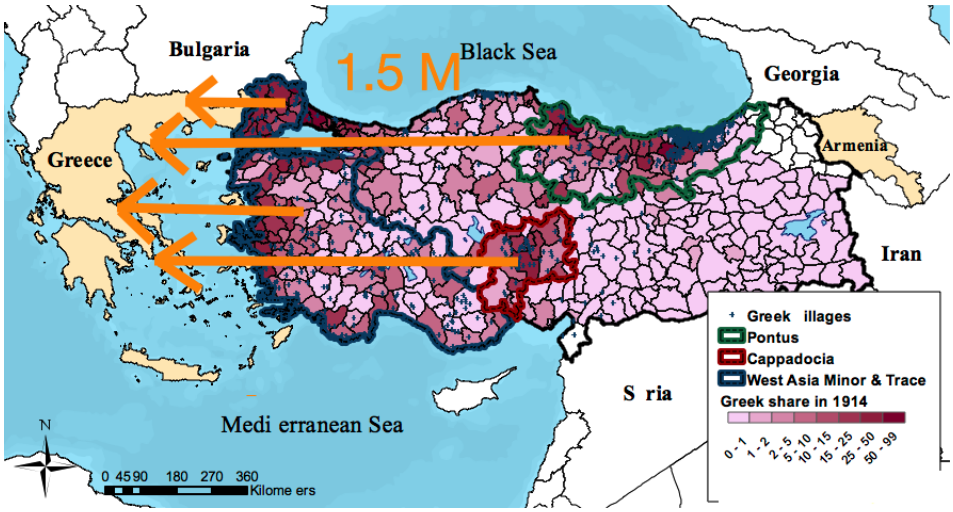
	Educational attainment						Last or current occupation					
	Junior High School			Primary School			Agriculture			High-skilled occupation		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Parents born in Turkey	-0.012	0.044	0.031	-0.016	0.039	0.030	-0.029	-0.060	-0.056	-0.076***	-0.042*	-0.041*
	(0.031)	(0.032)	(0.029)	(0.056)	(0.062)	(0.067)	(0.041)	(0.040)	(0.040)	(0.022)	(0.025)	(0.025)
R2	0.08	0.21	0.31	0.17	0.21	0.23	0.08	0.29	0.33	0.07	0.15	0.21
N	1,715	1,715	1,715	448	448	448	1,305	1,305	1,305	1,305	1,305	1,305
Sex and year of birth	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE		Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
Parental characteristic			Yes			Yes			Yes			Yes
Average outcome	.21	.21	.21	.8	.8	.8	.43	.43	.43	.13	.13	.13

Note: Data come from the 2002, 2004 and 2010 rounds of the European Social Survey. Primary School completion is only available in the 2010 round. The sample is restricted to individuals born between 1923 and 1950 and exclude respondents living in big cities (making up one third of the initial sample). All regressions controls for year of birth dummies and sex. Region FE stands for a set of fixed-effects controlling for the 10 Greek regions as well as urbanity (big cities outskirt, town or small city, country village) Parental characteristics include mother's and father's education and last employment status when respondent was age 14 (employed, self-employed, inactive). Heteroskedasticity-robust standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

A Appendix

Figure A.1: The population exchange of Greek Orthodoxes and Muslims Turks

(a) Greek-Orthodoxes in Ottoman Turkey in 1914



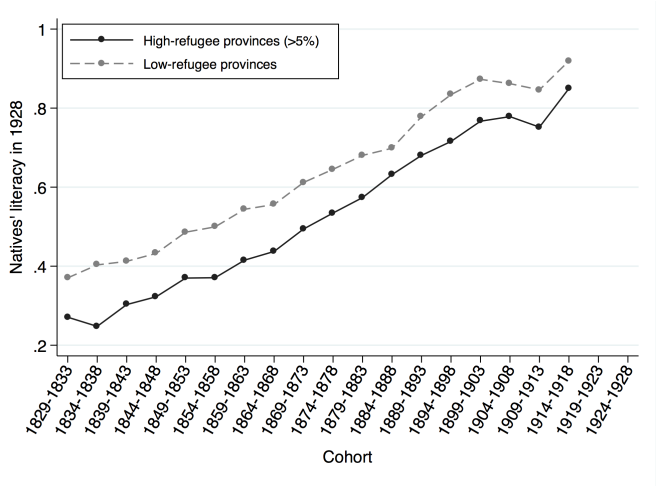
(b) Muslim Turks and Bulgars in Greece in 1920

Notes: Data in figure (a) come from the 1924 Ottoman population data. The darker the red color, the higher the number of Greek Orthodox relative to the 1914 population. Data in figure (b) come from the 1928 census of the Kingdom of Greece. The darker the green color, the higher the number of Turks and Bulgars left between 1920 and 1928 over the 1920 population.

Figure A.2: Matching municipalities over time: The Hellenic Society for Local Development and Local Government (EETAA)

Figure A.3: Pre-trend in literacy rate of natives across birth cohorts and provinces

(a) Literacy rate of native males in 1928



(b) Literacy rate of native females in 1928

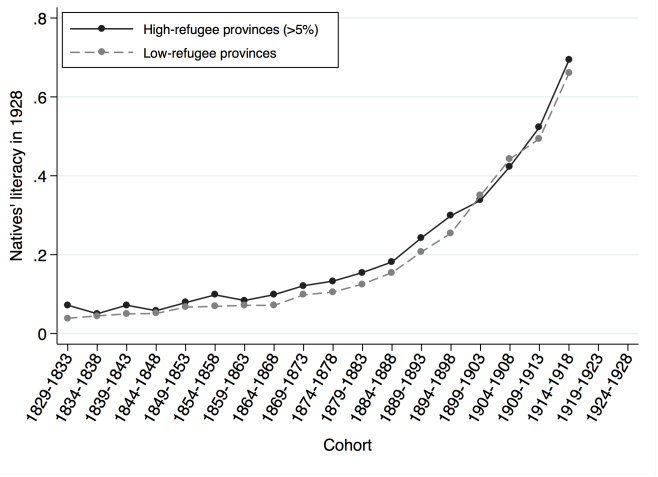
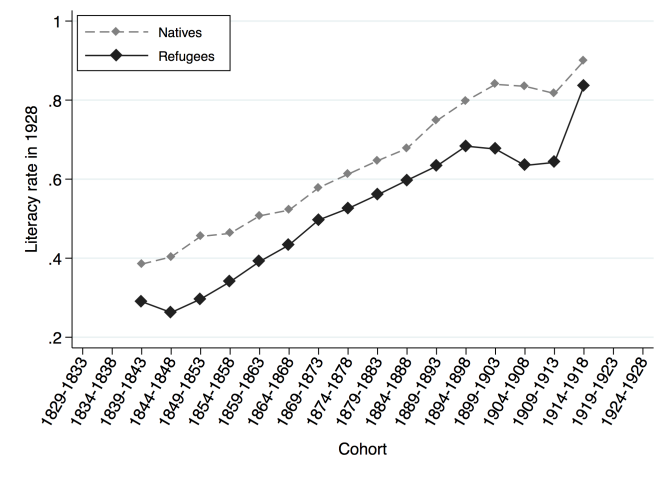


Figure A.4: Literacy rate of refugees and natives in 1928

(a) Among men



(b) Among women

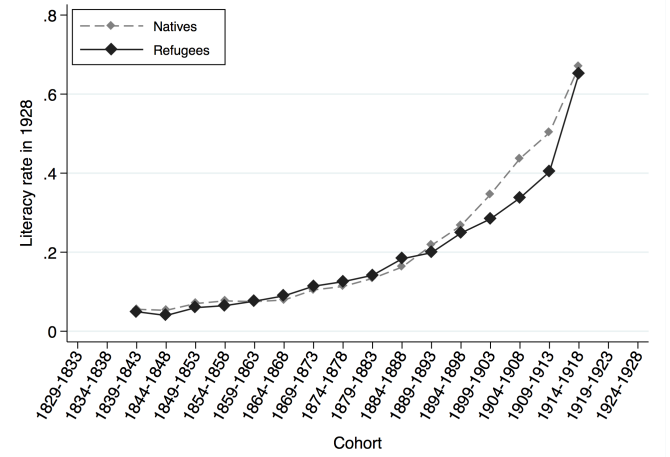


Figure A.5: Profession of refugees and natives in 1928

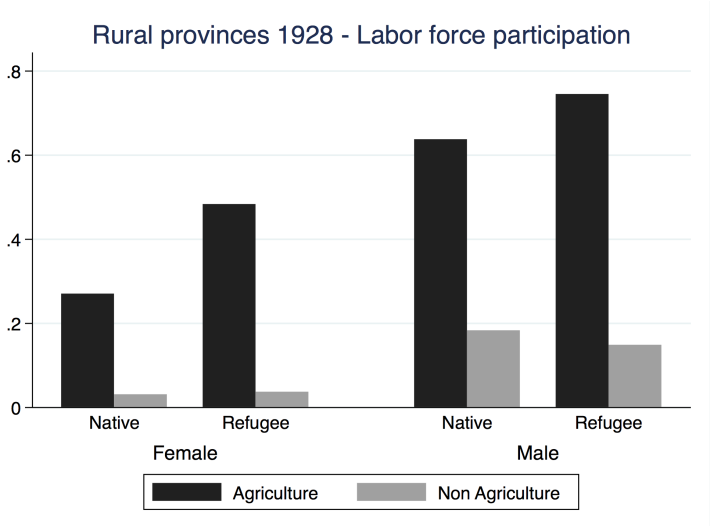


Figure A.6: Cumulative distribution function of the share of refugees, relative to the 1920 population

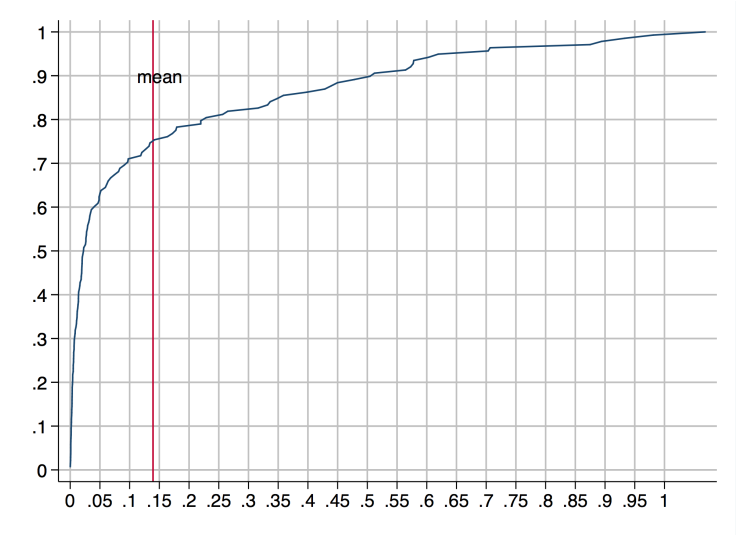


Table A.1: Geographical characteristics and share of refugees at the province level

Dependent variable:	Share of refugees in 1928								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Effect of one standard-deviation increase in:									
Distance to railway network in 1920 (km)	-0.069***								0.003
	(0.019)								(0.019)
Distance to rivers (km)		-0.040**							-0.038**
		(0.020)							(0.017)
Altitude (m)			-0.049**						-0.166***
			(0.020)						(0.029)
Mean annual precipitation				-0.065***					0.017
				(0.019)					(0.024)
Mean annual temperature					-0.079***				-0.045
					(0.019)				(0.080)
Number of frost free days						-0.088***			-0.078
						(0.019)			(0.063)
Length of growing period (days)							-0.091***		-0.130***
							(0.019)		(0.031)
Suitability index of crops								0.127***	0.033*
								(0.017)	(0.019)
R2	0.09	0.03	0.04	0.08	0.11	0.14	0.15	0.29	0.63
N	138	138	138	138	138	138	138	138	138
Average of the variable of interest	81.6	11.2	398.16	640.09	14.09	261.45	199	-.01	

Note: Unit of analysis is province; cities according to the 1928 statistical definition are excluded. Heteroskedasticity-robust standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

Table A.2: Pre-settlement economic characteristics and the share of refugees at the province level

Dependent variable:	Share of refugees in 1928					
	(1)	(2)	(3)	(4)	(5)	(6)
Effect of one standard-deviation increase in:						
Share of Turks and Bulgars in 1920	0.132***					
	(0.011)					
Population density (log) in 1920		-0.018				
		(0.016)				
Share of agriculture in employment in 1920			0.062***			
			(0.015)			
Literacy rate in 1920 (15-65)				-0.091***		
				(0.016)		
Share of agriculture in employment among non-refugees in 1928					0.019	
					(0.016)	
Literacy rate of non-refugees in 1928						0.014
						(0.015)
Geographical controls	X	X	X	X	X	X
R2	0.83	0.63	0.68	0.71	0.63	0.63
N	138	138	136	136	138	138
Average of the variable of interest	.08	3.44	.72	.41	.77	.51

Note: Unit of analysis is province; cities according to the 1928 statistical definition are excluded. Geographical controls include: distance to railway network in 1920 (km); distance to rivers (km); mean altitude (m); mean annual precipitation in the period 1960–1990 (mm); mean annual temperature in the period 1960–1990 (degrees); number of frost free days; length of the growing period; suitability index of crops. Heteroskedasticity-robust standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

Table A.3: 1928 refugees and pre-exchange characteristics (municipality level)

Dependent variable:	Share of refugees in 1928										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Effect of one standard-deviation increase in:											
Population density (log) in 1920 1920	-0.001										-0.020***
	(0.003)										(0.003)
Distance to urban centers (km)		-0.022***									0.002
		(0.005)									(0.006)
Distance to railway network in 1920 (km)			-0.108***								-0.085***
			(0.024)								(0.028)
Distance to rivers (km)				-0.029***							0.012
				(0.010)							(0.011)
Altitude (m)					-0.035***						-0.037***
					(0.003)						(0.008)
Mean annual precipitation						-0.023*					0.039***
						(0.013)					(0.014)
Mean annual temperature							0.039***				0.061***
							(0.004)				(0.018)
Number of frost free days								0.035***			-0.074***
								(0.005)			(0.016)
Length of growing period (days)									0.029***		-0.021***
									(0.004)		(0.008)
Suitability index of crops										0.036***	0.027***
										(0.003)	(0.005)
Province FE	X	X	X	X	X	X	X	X	X	X	X
R2	0.50	0.50	0.50	0.50	0.52	0.50	0.51	0.51	0.51	0.52	0.53
N	4,199	4,198	4,198	4,198	4,196	4,196	4,196	4,196	4,196	4,196	4,196
Average of the variable of interest	3.49	26.95	66.44	7.82	469.07	700.76	13.77	253.99	203.48	-.05	

Table A.4: 1928 refugees and pre-exchange characteristics (province level)

Sample of regions where no Turks were living in 1920 (Euboea, Central Greece, Peloponnese)

Dependent variable:	Share of refugees in 1928				
	(1)	(2)	(3)	(4)	(5)
Effect of one standard-deviation increase in:					
Population density (log) in 1920	0.001				
	(0.005)				
Share of agriculture in employment in 1920		0.001			
		(0.005)			
Literacy rate in 1920 (15-65)			0.001		
			(0.004)		
Share of agriculture in employment among non-refugees in 1928				-0.005	
				(0.005)	
Literacy rate of non-refugees in 1928					-0.000
					(0.004)
Geographical controls	Yes	Yes	Yes	Yes	Yes
R2	0.46	0.46	0.46	0.47	0.46
N	58	58	58	58	58
Average of the variable of interest	3.62	.68	.48	.73	.55

Note: Unit of analysis is province; cities according to the 1928 statistical definition are excluded. Geographical controls include: distance to railway network in 1920 (km); distance to rivers (km); mean altitude (m); mean annual precipitation in the period 1960–1990 (mm); mean annual temperature in the period 1960–1990 (degrees); number of frost free days; length of the growing period; suitability index of crops. Heteroskedasticity-robust standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

Table A.5: Matching estimator balancing test:
Pre-settlement economic and geographical characteristics at the municipality level

Standarized Dependent variable:	Pop. density (log) in 1920	Distance to			Altitude	Average annual		Frost free dyas	Growing period	Suitability of crops
		Cities (1928)	Rivers	Railway in 1920		precipitation	temperature			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A - Spatial matching estimator: contiguous municipalities										
Treated (Share of refugees >5%)	0.204***	-0.045	-0.051	-0.088	-0.247***	-0.188***	0.036	-0.008	-0.078	0.220***
	(0.066)	(0.062)	(0.057)	(0.062)	(0.066)	(0.052)	(0.065)	(0.063)	(0.064)	(0.066)
N	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104
Panel B - Spatial matching estimator: contiguous municipalities and propensity score										
Treated (Share of refugees >5%)	0.076	0.041	0.039	0.004	-0.023	-0.082	-0.030	-0.038	-0.108	-0.056
	(0.078)	(0.076)	(0.067)	(0.071)	(0.075)	(0.068)	(0.073)	(0.071)	(0.073)	(0.078)
N	745	745	745	745	745	745	745	745	745	745

Note: Unit of analysis is municipality; All dependent variable have been standarized, i.e. subtracted by their mean and divided by their standard-deviation; cities according to the 1928 statistical definition are excluded. In Panel B estimator, the control group is constructed by picking, for each treated municipality, the contiguous untreated neighbors that have the most similar geographical characteristics using propensity score matching. We exclude 20% of the treated-control matches that are too dissimilar in terms of propensity score based on geography. Heteroskedasticity-robust standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1