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ABSTRACT

The Determinants of Refugees' Destinations: Where Do Refugees Locate within the EU?*

The recent so called Mediterranean refugee crisis has ignited concerns about the magnitude of the flows of asylum seekers to Europe. This paper examines the determinants of the destination choice of first time non-EU asylum applicants to the EU, between 2008-2020. It investigates the role played by policies related to employment rights, processing of asylum applications, attractiveness of the welfare system, economic factors and networks on the destination of asylum seekers within the EU. We find that the strongest pull factor for asylum seekers to a destination is social networks both in terms of previous asylum applicants as well as stock of previous migrants. Our findings also suggest that employment bans are not a strong deterrence for asylum seekers given their modest association to asylum flows.

JEL Classification: F22, J61, J15, O52

Keywords: asylum seekers, refugees, EU migration, employment ban

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1 Introduction

One of the main challenges that European countries have been facing in the most recent years is the large inflows of asylum seekers. The annual number of first time asylum applications in the EU has constantly increased since 2007 and reached its peak in the years 2015 and 2016, due to the Syrian war, as shown in Figure 1. Post the global pandemic, the asylum inflows have continued to grow because of the fall of Afghanistan in 2021 and the more recent Russian invasion of Ukraine in 2022 which resulted in millions more being displaced. The unstable geopolitical situation, among others, suggest that more people will seek refuge in the next years.

Given the increasing numbers of asylum seekers, understanding the key determinants of the location choice of asylum flows is important. In particular, whether policies in the destinations deter or attract more asylum seekers is instrumental for policymakers. For example, some host countries have been less welcoming and introduced more restrictive policies. More specifically, banning asylum seekers from employment has been used by some host countries to deter asylum seekers, despite little evidence on the effectiveness of such policy.[1] At the same time, little is known on whether, and the extent to which, asylum seekers' destination choice is shaped by economic incentives, or by welfare spending and how their choice may differ from other types of migration. Looking at the last two decades, Figure 2 shows the annual shares of non-EU first time asylum applicants in the EU. The heatplot suggests that asylum inflows are more concentrated in certain EU countries. For instance, in 2019, the highest shares of asylum seekers were in Germany, Spain, and France. At the same time, there is variation over time in terms of the share (and number) of first time asylum seekers by country of destination. For instance, Germany received 60 percent of EU asylum applications in 2016, but only 21 per cent in 2019. Also, Figure 3, which shows the total number of first time non-EU asylum applications and total non-EU migrants by destination and origin in the EU, over 2008-2019, highlights the difference in rank of the top EU countries receiving asylum seekers compared to the rank of the top EU countries destinations of total migrant inflows.[2] Interestingly, there is a clear distinction between the main countries of origin of asylum seekers who mostly originated from countries inflicted by war and conflict such as Syria, Afghanistan, Iraq, Pakistan and Nigeria. Therefore, identifying the factors and policies that may attract/deter asylum applications is important to understand the distribution of applications within the EU.

This paper examines the pull factors that drive asylum seekers to go to particular destinations within the EU. We study the determinants of the destination location of first time non-EU asylum seekers, between 2008-2020 and aim to distinguish and measure the role of these factors.[3] This period of analysis allows us to examine the so called Mediterranean refugee crisis as well. We use a gravity model where we include the traditional pull factors such as economic factors (income and unemployment), geography (proximity and distance), and culture (language, and colonial ties). In addition, we include various measures to capture

[1] See James and Mayblin (2016).

[2] Total migration flows are only available until 2019.

[3] Note that we stop our analysis to 2020 before the pandemic. Also, the UK was a member of the European Union until 2021 and also the eruption of the Ukraine-Russia war was in 2022.

the asylum applications' process, namely: processing time of first time asylum applications, recognition rate and repatriation risk rate of asylum seekers. More importantly, we focus on the generosity of the welfare system, and the role played by the welfare state in attracting asylum seekers, and changes in policies dealing with access to social security. Furthermore, we also examine the role of asylum seekers' employment rights. Finally, we capture the importance of social networks using the number of previous asylum seekers from origin in destination, as well as previous migrant stock. To our knowledge, no study has attempted to distinguish between all these various drivers of the destination choice of asylum seekers at the same time.

This paper contributes to the migration literature by investigating the determinants of asylum applications in the EU over time. In contrast to the previous studies, we examine various determinants of asylum flows rather than focus on one set of drivers, by considering asylum application process in addition to the traditional economic factors, and social networks. We provide evidence on the effects of employment rights of asylum seekers on asylum inflow, an issue hardly studied before, as well as investigate the attractiveness of generous welfare states to asylum seekers. The aim of the paper is to measure and quantify the associations of all those factors with first time asylum applications in the EU.

We build on a large literature that estimates the determinants of international migration using the gravity model. The gravity model of migration is micro-founded on random utility maximisation where the individual chooses where to locate based on the destination which maximises their utility given the expected benefits and costs, see Beine et al. (2016). Hence, this literature has established the importance of income and unemployment in the destination as pull factors as well as the role of distance and language in terms of increasing the cost of migration, for example Grogger and Hanson (2011); Mayda (2010); Adserà and Pytlikovà (2015). However, these studies have not examined asylum seekers/refugees but rather the determinants of total migration flows and typically find a very strong effect for income and unemployment.[4] An exception are the studies by Tim Hatton, e.g. Hatton (2004), and Hatton (2016), where for example Hatton (2004) finds that economic factors are important determinants of asylum flows consistent with the typical findings in the migration literature. However that study covers flows to the EU in the 1980s and 1990s, a different period in terms of the magnitude of conflicts and the size of the flows compared to the recent so called Mediterranean crisis. Similarly, Hatton (2016) examines asylum applications to 19 OECD destinations from 48 origin countries over the years 1997– 2012.

There is also a large body of literature investigating the role of the welfare magnet in attracting migrants, e.g. Boeri (2010); De Giorgi and Pellizzari (2009); Razin and Wahba (2015). A widespread concern in EU countries, often exploited in the political discourse of far-right and populist parties, is that immigrants are attracted to the generous welfare system. For example, Borjas (1999) shows that in the US migrants tend to cluster in areas with more generous welfare system, especially if they are low educated and thus more dependent on the welfare benefits. However, the empirical evidence on the role of the welfare magnet is

[4]It is important to acknowledge that despite the limited focus by economists, other social scientists, in particular political scientists, have studied various determinants of the location of asylum seekers, e.g. Neumayer (2005), Toshkov (2014), and Barthel and Neumayer (2015).

somewhat mixed (see Giulietti and Wahba (2013) for a review). A recent study that uses reforms of immigrant welfare benefits in Denmark, finds that reduction of benefits reduced the net flow of immigrants and the subsequent repeal of the benefits reversed the effect almost exactly. The estimated elasticity of migration with respect to benefits is equal to 1.3. Yet, little is known about the role of welfare benefits on asylum seekers' locational choice. Hatton (2009); Hatton and Moloney (2017) use a broad measure of "welfare" policy to capture changes in policies related to access to work, access to welfare benefit, detention policy, deportation policy, and family unification. They find that the broad welfare index does not have a significant effect on asylum applications. However, this is a composite index of policy changes rather than actual policy and covers a rather heterogeneous collection of reception conditions and rights across five different types of policies, not specific to refugees and not focused on welfare spending. We examine the role of the welfare system directly by focusing on social spending and policies related to access to social spending by asylum seekers/refugees.

A very small literature has focused on the determinants of asylum flows and on the role of asylum policies, in particular, on the asylum applications process. Earlier work by Hatton (2009) studying the determinants of asylum applications, find that violence and terror play a much important role and that tougher policies did have a deterrent effect, they accounted for only about a third of the variation in applications between 2001 and 2006. Andersson and Jutvik (2022) have used quasi-experimental evidence to understand how changes in asylum policy where all Syrian asylum-seekers would be granted permanent instead of temporary residence permits affected asylum application numbers. They find that the number of Syrian asylum-seekers to Sweden increased very quickly. However, due to the longer processing time this increase did not persist in the long run. A few studies have focused on the effect of recognition rate on asylum applications, e.g. Toshkov (2014); Keogh (2013). More recently, Bertoli et al. (2022) have focused on the impact of processing time of asylum applications and the risk of repatriation for asylum seekers whose applications are rejected. They find that reduced processing times have a heterogeneous impact depending on the recognition rate and on the repatriation risk. They conclude that those policy measures have played a non-negligible role in shaping the distribution of asylum seekers across European countries. Görlach and Motz (2020) have examined the strategic interaction between the recognition rates of different countries, highlighting the importance of spillovers in policy. Our paper also examines the asylum applications' process in terms of processing time, recognition rate and risk of repatriation, but control for all the other potential pull factors.

Also, another key determinant of migration flows, which is well established in the migration literature, is migrant networks in destination. Migrants typically rely on their social networks in destination to provide them with information and support. Many studies find strong evidence on the role of social networks in influencing destination choice of migrants, see, for example, Beine et al. (2011); Munshi (2020). There are very few studies that examine the role of networks for asylum flows. For example, earlier work by Hatton (2004) examining the determinants of the decline in asylum flows to Europe in the 1980s and 1990s, find a positive strong impact of social networks measured as the cumulative asylum flow from origin

in destination up to the previous year.[5] Also, Hatton (2009) finds a strong positive effect of social networks on asylum applications to OECD 1997-2006, measured as migrant stocks from source in destination in 2000-1. In fact Hatton (2020) in his recent review argues that the most powerful single determinant of asylum flows to a country is the stock of previous migrants from the same origin in that destination. However, there is little recent evidence on the role of social networks for asylum seekers, and more importantly on the role of social networks after controlling for all the other factors including asylum application process, and policies.

Finally, a related strand of the migration literature has examined the integration of refugees in the labour market. In particular, there has been a recent growing interest in the impact of employment ban for asylum seekers on long-term employment and labor market integration, see e.g. Fasani et al. (2021a); Clemens et al. (2018) . For example, Fasani et al. (2021a) use data on employment restrictions for refugees entering European countries between 1985 and 2012. They find that exposure to an employment ban at arrival on asylum seekers reduces refugees' employment probability in post-ban years by 15 percent and that the detrimental effect lasts up to 10 years post arrival. Hvidtfeldt et al. (2018) examine the effect of refugees' length of waiting time in the Danish asylum system when their labour market is restricted on their subsequent employment using administrative data from Denmark. They find that an additional year of waiting time without access to employment decreases subsequent employment by 3.2 percentage points on average. Also, Ruiz and Vargas-Silva (2018); Fasani et al. (2021b) find that refugees experience worse labour market outcomes compared to economic migrants in the long run; i.e. refugees tend to be less integrated in the labour market not only relative to natives but also economic migrants. Despite those potential negative impacts, employment bans on asylum seekers may appeal to governments as a mean of deterrence to reduce the number of asylum applications. However, surprisingly there is little if any empirical evidence showing the deterrence effect of employment bans. This paper examines this important yet understudied issue regarding the role of employment rights as a potential pull factor for asylum seekers.

In this paper, we use the dyadic number of first time asylum applications (i.e. by origin-destination) measured quarter yearly between 2008 and 2020, based on EUROSTAT (2021a). We focus on flows to EU destinations from all non-EU origin countries. We estimate an extended gravity model of asylum applications at origin-destination-time level using Poisson Pseudo Maximum Likelihood (PPML) where we also control for various pull factors that are likely to drive asylum seekers to particular destinations within the EU. Importantly, we examine the role of economic factors, asylum application process, welfare spending, employment rights and social networks. More specifically, given our interest in employment rights/ban, we use the length of the employment ban in month. To capture attractiveness of the welfare system we use the share of social spending in GDP, as well as a policy index measuring access to social spending for asylum seekers. Moreover, to measure social networks, we use the cumulative sum of previous asylum applications, but we also use several other measures including stocks of previous migrants. To address the potential endogeneity of these variables

[5] Neumayer (2005) also finds strong impact of existing communities of past asylum seekers on asylum applications in Western Europe between 1982-1999. Also, Barthel and Neumayer (2015) find evidence of spatial dependence of asylum migration.

to some extent, we lag all those controls. However, we do not claim that our estimates are causal. We control for the asylum application process proxied by processing time, recognition rate and repatriation risk. We also use different measures for our dependent variable, and for the employment ban, social spending and social networks variables to check the robustness of our results. In addition, we control for the potential interdependence between EU destinations (i.e. multilateral resistance of migration, see Beine et al. (2016)) and follow Ortega and Peri (2013) and use origin-time fixed effects. This also allows us to control for all observable push factors, such as conflict, which are origin-time specific and allows us to focus on the role of the pull factors.[6]

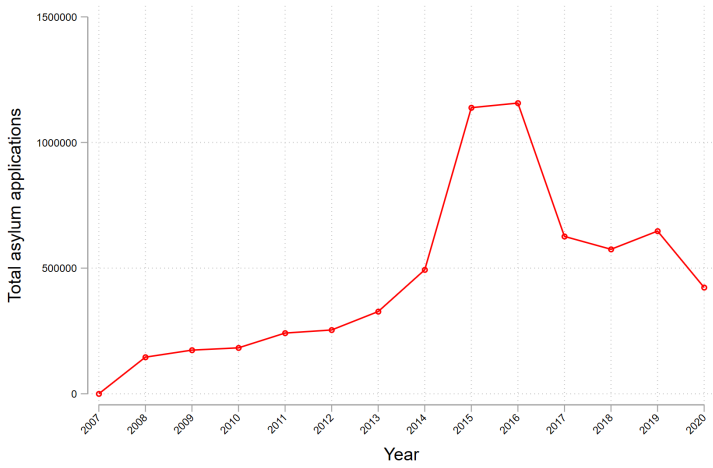
We find that social networks measured by the cumulative sum of previous asylum applications and stock of migrants are the most dominant determinants of where first time asylum applicants locate within the EU. Although economic factors are important, they are not the main drivers of the destination of asylum flows. Also, policies matter little for location choice of asylum seekers. Importantly, there is little evidence that asylum applicants are attracted by generous welfare systems. Furthermore, employment rights are not highly correlated with the number of asylum applications suggesting that employment ban is hardly justified based on this evidence. Although we acknowledge that many of the determinants we study including policies and processes are potentially endogenous, and although we use lagged variables throughout, we see our results as providing associations as opposed to causal relationships that are nevertheless useful evidence for policy.

This paper has important policy implications. Asylum seekers are fleeing war and prosecution and hence are vulnerable. This might explain the importance of social networks in where they locate. Although host countries are eager to have policies to deter irregular migration, there is little evidence that such policies are effective in terms of reducing the number of asylum applicants or are cost effective. In particular, banning asylum seekers from employment, leads to more reliance on public spending in the short term, and potential exploitation. Almost all European countries, except for Croatia, Sweden and Greece, impose a period of labour market ban to prevent asylum seekers to work during the asylum application process. Therefore, asylum seekers are more dependent on the welfare benefits during the period of employment ban. In the long run, the ban has a detrimental effect on the employment opportunities of refugees and lead to less integration in the labor market, as found by Fasani et al. (2021a). Hence, lifting the employment ban seems to be more cost effective and better for the integration of refugees in the long term.

The rest of the paper is organised as follows. Section 2 presents the data and descriptive statistics of the main factors of interest. In Section 3 we discuss the methodology and the main results. We also present estimates using alternative measures and specifications to check the robustness of our results. Section 4, the Conclusion, summarises the main findings and main policy implications.

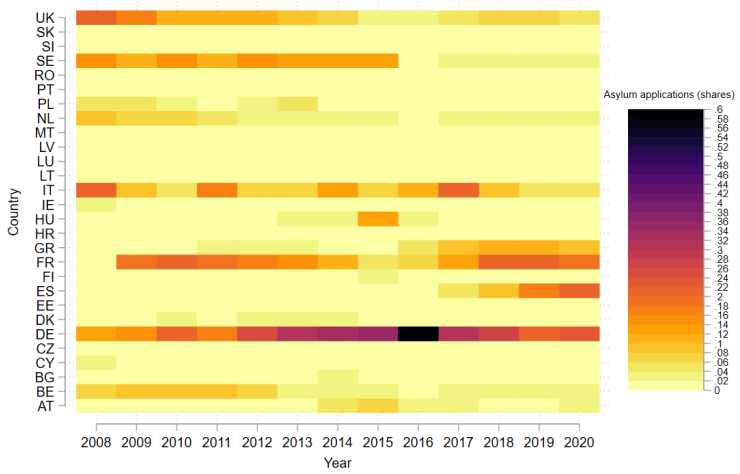
[6] An interesting issue that we are unable to address using the data we have is the characteristics of asylum seekers. Aksoy and Poutvaara (2021) examine the selectivity of refugees and irregular migrants who arrived in Europe in 2015 or 2016. They find that those refugees were positively selected in terms of education.

Figure 1: Trend of annual first time asylum applications in the EU, 2007-2020, in thousands



Source: Eurostat data on asylum protection and managed migration, years 2007-2020. **Notes:** The Figure shows the trend for the total annual number of asylum applications received by EU countries.

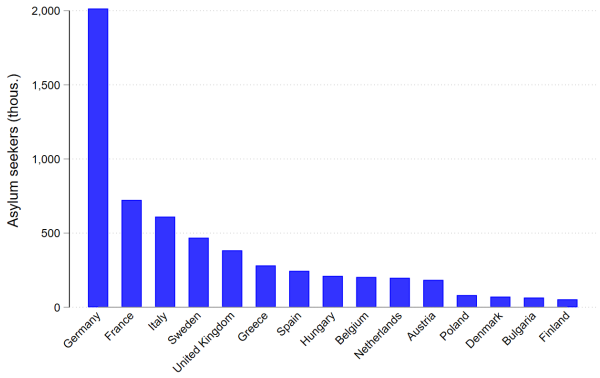
Figure 2: Annual share of non-EU asylum flows to EU countries, by destination, 2008-2020



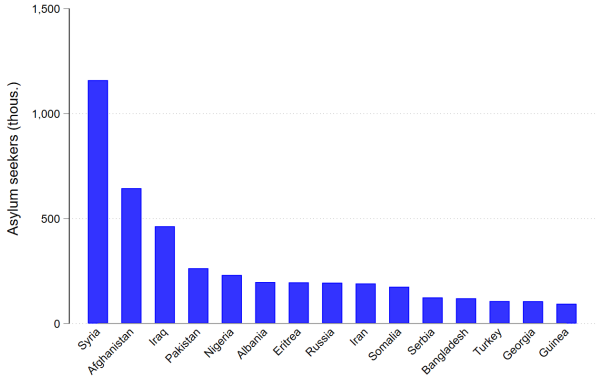
Source: Authors' calculations based on Eurostat data on asylum protection and managed migration. First time asylum applications. Years 2008-2020. **Notes:** Figure 2 shows the the annual share of asylum applications by destination country and year.

Figure 3: Top 15 destinations and countries of origin, total 2008-2019

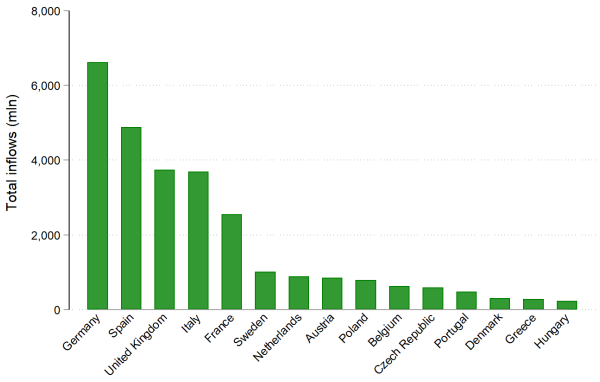
(a) Destinations of Asylum Flows



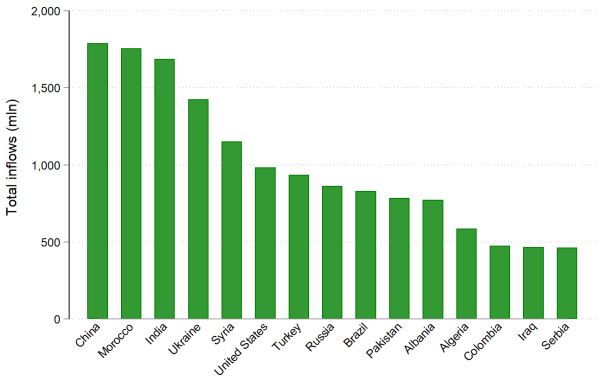
(b) Origins of Asylum Flows



(c) Destinations of Total Migrant Flows



(d) Origins of Total Migrant Flows



Source: Authors' calculations based on Eurostat data on asylum protection and managed migration and OECD data on migration inflows by nationality. **Notes:** The Figure refers to the total value in the considered time span (2008-2019). The values in sub-figures 3a and 3b are expressed in thousands, while the values in sub-figures 3c and 3d are expressed in millions.

2 Data and descriptive statistics

First, we discuss the various data sources used in the empirical analysis. We make use of detailed data on asylum applications in the EU based on EUROSTAT (2021a). An asylum seeker is defined as a third-country national (non-EU citizen) applying for international protection in an EU member State. The asylum statistics provide information on the number of asylum applicants and the decisions on applications and resettlement. We use EUROSTAT (2021a) to build our dependent variable, which is defined as the number of first time asylum applications from citizens of country o to destination country d in a quarter year. We calculate the quarter yearly total asylum applications based on the monthly information released by EUROSTAT (2021a). We also use as a robustness the quarter yearly percentage of asylum applications defined as the percentage of first time asylum applications from citizens of country o to destination d over the total number of first time asylum applications from citizens of country o in the EU, as well as the quarter yearly percentage of asylum applications defined as the percentage of first time asylum applications from citizens of country o to destination d over the total population size of country o.[7] The main sample of analysis consists of 28 EU destination countries (EU 28) observed for up to 44 quarters within the time span 2008-2020 and up to 193 non-EU countries of origin. The unit of observation is the origin-destination-time i.e. dyad in a quarter year. Our sample is comprised of 27,476 observations.

In addition, we rely on EUROSTAT (2021a) to calculate several measures related to asylum applications' processes and outcomes. More specifically, we construct three measures: processing time, recognition rate and repatriation risk.[8] All three measures are available at origin-destination-time level, but are measured at different time frequency. First, *Processing time* is measured by comparing the monthly stock of pending applications in destination d from citizens of country o and the cumulative sum of first time asylum applications in destination d from citizens of country o. Following the methodology of Bertoli et al. (2022), and OECD (2018), processing time is calculated as the number of months such that the latter is lower or equal to the former. EUROSTAT (2021a) releases that information monthly, hence we first define the number of months of waiting based on the monthly information, and then calculate the quarter yearly average. The second measure is *Recognition rate* which is defined as the percentage of first-time decisions with a positive outcome in destination d for asylum applicants from country o.[9] This measure is available at a quarter yearly frequency. Finally *Repatriation risk* is defined as the ratio of the number of citizens from country o who received an order to leave from destination d over the total number of negative final decisions in destination d for citizens of country o in the previous year. As EUROSTAT (2021a) provides this information on a yearly basis, so we only have a yearly time variation for this variable.

To measure the role of the generosity of the welfare system, we use a direct measure,

[7] The second measure is commonly used as a proxy for emigration rate.

[8] See Bertoli et al. (2022) for methodology and definitions of these variables.

[9] These include all applicants who have been granted refugees status, subsidiary protection status, temporary protection, or authorization to stay for humanitarian reasons.

namely total social spending in the destination country.[10] We use data from Eurostat data on social spending, which provide information at the destination country level and yearly frequency.[11] We use the variable expressed in terms of GDP percentage.[12] However, often migrants do not enjoy the same welfare benefits of natives and this is true also for asylum seekers (Kool and Nimeh, 2021). To proxy the effective asylum seekers' access to social protection we build an index of access to social protection using the DEMIG-QuantMig Migration Policy database. This database expands the original DEMIG database by covering all EU and EFTA countries, and extends the time span to 2020.[13] The main aim of this database is to register and classify migration policies according to a number of criteria, for instance whether the policy change makes the existing policy more or less restrictive.[14] Besides having information on the policy restrictiveness, the DEMIG-QuantMig database also records whether the policy tool involves a change in access to social protection, and register the target group of the policy change. Based on this detailed information, to build our index we only account for changes related to access to social protection targeted to asylum seekers. The database also records the magnitude of the policy change and distinguishes between minor, mid-level, and major change. Using this detailed information, we build an index of access to social protection similar in construction to Hatton (2004, 2016) and Hatton and Moloney (2017), but where we focus only on access to social protection for asylum seekers and refugees. The index starts at 0 in the first period of analysis and increases by one unit when the policy becomes less restrictive; i.e. when the policy change makes the access to social protection more favourable to asylum seekers. When the change is classified as a major change the index increases by 1.5. As the policy changes are registered on a yearly basis, this variable is defined at the destination-year level.

The DEMIG-QuantMig database records also policy changes related to work permit and visa, and in all cases the record is accompanied by a brief description of the policy change. This enables us to infer the number of months of ban from employment and access to the labour market for asylum seekers in place by destination country. We complement this with information from other available technical reports, in the few cases where data on the months of ban are missing in the DEMIG-QuantMig database.[15] In the very few remaining cases in which we do not manage to have any information on the ban length, we proxy it using processing time.[16] Also this variable is defined at the destination-year level.

[10] It is important to note that this is total social spending and not only spending directed toward refugees and immigrants. This is also why we include another variable to measure access to social protection for asylum seekers, in particular.

[11] Source: EUROSTAT (2021c). It is important to note that when using yearly data we assume the value to be constant in all four quarters of the relevant year.

[12] We also run a robustness check with this variable expressed in per capita PPP, which is presented in Column 3 of Table 9.

[13] The original DEMIG database has information up to 2014.

[14] For more detailed information on the DEMIG-QuantMig database, see Czaika et al. (2021)

[15] We refer to the following documents: https://www.migrationwatchuk.org/briefing-paper/4.24 and https://www.oecd.org/els/mig/migration-policy-debates-10.pdf

[16] In that case, we assume that asylum seekers are eligible to work when their claim is accepted. To test the sensitivity of our analysis to this missing information, in Table A.2 we run a robustness check excluding the countries for which we do not have information on the length of the employment ban.

Finally, in the analysis we control for the traditional gravity variables. We use quarter yearly unemployment rate available from EUROSTAT, and quarter yearly real GDP per-capita available from OECDStat.[17] Both variables are at the destination level. In addition, we include a vector of time-invariant dyadic variables to control for geographical and cultural factors linking origin and destination countries. These are binary variables taking the value 1 if the two countries share a common language, ever had colonial ties, and share a border. We also include the distance between the capital cities of the two considered countries. These variables come from the CEPII *Gravity* database.[18]

Table 1 presents some descriptive statistics for the above described variables where the unit of observation is the dyad per quarter year, i.e. origin-destination-time. The table presents the averages of observations over the period of analysis, 2008-2020. The quarter yearly average number of first time asylum applications per dyad is around 171 applications for the whole period. Not surprisingly, this average masks a huge variation both among and within destinations over time. For example, the maximum value corresponds to the number of first time asylum applications from Syria to Germany in quarter 1 of 2016. For France and Sweden, the maximum values (32,019 in quarter 2 of 2018 and 31,435 in quarter 4 of 2015, respectively) refer to the inflows from Afghanistan. The highest value for Italy (8005) refers to the inflow of Nigerians in quarter 1 of 2017, while the highest value for the UK is the inflow from Zimbabwe in the first quarter of 2009.

We also capture the role of social networks using the cumulative sum of asylum applications from citizens of country o in destination d from the first quarter of the analysis up to one year before the quarter of interest; i.e. cumulative sum of applications up to the previous year similar to Hatton (2004, 2009). This allows us to examine whether new asylum applicants follow in the footsteps of the (most recent) previous asylum applicants, and to compare the magnitude of this variable relative to other determinants. Table 1 shows that the number of cumulative sum of asylum applications per dyad averaged over 2008-2020 is 3936. However this also does not show the huge variations over destinations and time given the huge variation observed in terms of asylum flows.

Looking at the welfare system, the average spending for the EU countries, which measures the overall generosity of the destination countries' welfare state, in the considered period (2008-2020) is 28.1% of GDP. The most generous country is France with an average of 33.3 %, while the country that spends the least is Ireland with an average value of 21.2 %. Access to social security policy index captures the policy implemented in the destination countries to facilitate/restrict access to social protection for asylum seekers. The average value is 0.17 suggesting that not many countries have implemented favourable policies during the considered period. The UK shows the minimum value during the years 2008 to 2014. However, in 2019 the value for the UK was -0.5 suggesting that the country has implemented less restrictive policies in the most recent years. The maximum value refers to Luxembourg in 2019. Also, examining months of ban which refers to the length of time in months in which asylum seekers with a pending application are not allowed to enter the job market, Table 1 shows the average value is 7.2 months. Only Croatia, Greece, and Sweden do not impose any

[17] OECD.Stat (2021c)
[18] Head et al. (2010).

employment ban, while Portugal has in place 1 month ban. Austria and Ireland do not allow asylum seekers to access the job market until a final decision on their applications is taken, and in these cases we proxy months of ban with the processing time of asylum application. In 2015, Italy and Germany introduced a policy change in which the ban was reduced from 9 to 3 months for Germany and from 6 to 2 months for Italy.

Examining the variables capturing the asylum applications' process, Table 1 shows the *Recognition rate* which proxies the percentage of successful applications over the total number of applications. The average value is 17.34 and the maximum value is 100 suggesting that for some origin-destination pairs and some quarters all applications are successful. This happens in a few number of cases and especially for citizens of Afghanistan, Iraq, Syria, and Yemen. The average value of *Processing time* is 8.04 months which is close to the average value for Germany (8.77). The main destination country that has shorter waiting time is Italy, with an average of 0.6 and a maximum of 4 months. The countries with longest waiting time are Austria with an average of 17.06 months and a maximum of 40 months, and Belgium with an average of 17.46 months and a maximum of 39 months. Repatriation risk measures the risk of receiving an order to leave. The average value is 7.35 suggesting that on average this risk is moderate, however the high value of the standard deviation implies a high level of variability in the sample. Although this variable is a ratio, the maximum goes above 100. The reason is that while at the denominator we have the total number of negative final decisions, at the numerator we have the number of citizens who received an order to leave at time t irrespective of when they first applied and whether they have applied more than once (appealed). The latter can double count citizens in the case there was an appeal process. Therefore, the numerator may exceed the denominator which explains why in some cases the maximum value is above 100.[19] Among the main destinations, the UK has the highest average repatriation risk (20.32), while Sweden has the lowest (1.32).

[19]See also, Bertoli et al. (2022) for further explanation. In Table A.2 we run a robustness check in which we exclude the observations in which we have values of repatriation risk greater than 100, and our results are robust.

Table 1: Descriptive statistics, first time asylum seekers applications to the EU, average for 2008-2020

Variable	mean	sd	min	max	obs
Asylum applications (per dyad, quarterly)	170.771	1397.044	0	97975	27,476
Asylum applications (at destination, yearly)	0.169	2.414	-4	11.5	27,476
Months of ban (at destination, yearly)	7.185	4.588	0	39	27,476
Total social spending (GDP %) (at destination, yearly)	28.106	4.569	13.6	34.5	27,476
Cumulative sum of asylum applications (per dyad, quarterly)	3936.176	19413.69	0	656660	27,476
Recognition rate (%) (per dyad, yearly)	17.342	27.377	0	100	27,476
Processing time (months) (per dyad, quarterly)	8.039	6.992	0	40	27,476
Repatriation risk (per dyad, yearly)	7.352	30.923	0	782	27,476
Contiguity (per dyad, time invariant)	0.007	0.085	0	1	27,476
Common language (per dyad, time invariant)	0.137	0.356	0	1	27,476
Colony ties (per dyad, time invariant)	0.110	0.356	0	1	27,476
Distance between capitals (ln) (per dyad, time invariant)	8.341	0.607	4.765	9.700	27,476
Unemployment rate (%) (at destination, quarterly)	8.179	4.206	2	26.3	27,476
Real GDP per capita (ln) (at destination, quarterly)	10.657	0.258	9.699	11.676	27,476

Notes: The unit of observation is the number of the dyadic first time asylum applications measured quarter yearly. The mean is the average of all observations for the period 2008-2020. Source: Authors' calculations based on EUROSTAT (2021a), years 2008-2020; DEMIG-Quantmig data, years 2007-2019; Eurostat data on social spending, years 2007-2019; CEPII GeoDist database; World Bank data on Unemployment rate and real GDP per capita, years 2007-2019.

Table 2 reports the average values for the dependent variable and our main variables

of interest for the top 5 EU destination countries during the so called Mediterranean crisis period: 2015 to 2019. The Table shows a certain degree of variability among countries, both in terms of number of applications and variables of interest. For instance, Germany is by far the country which received the highest average number of first time asylum applications, while the UK received the lowest during that period. Not surprisingly, as a result, in terms of cumulative sum of previous applications, Germany has the highest value, while Sweden and the UK are the lowest amongst this group of destinations during that period. France has the highest average social spending, while the other countries show a very similar average with the exception of the UK which has the lowest value. In terms of access to social security, Italy has implemented more generous policies during that period.[20] Also, amongst this group of destinations, Sweden is the only country that guarantees immediate access to the labour market, while the UK has the highest number of months of ban.[21] Recognition rate is highest for Italy and lowest for Sweden, while processing time are shortest for Italy and longest for Germany. The UK has the highest average value for repatriation risk and Germany the lowest.

Although the above table shows the variation amongst the top 5 EU destinations, and since averaging over the whole period of analysis might mask interesting features, we focus on one year, namely 2016 which was a peak in terms of asylum inflows to the EU and present a heatmap of the distribution of first time asylum seeker applications in 2016, and how this correlates with our variables of interest, see Figure 4. The map shows high correlation between the location of first time asylum applicants and the cumulative sum of previous asylum applications (up to one year before). Also, we can notice that in general asylum seekers tend to concentrate more in countries that have higher rates of social spending, but not as much in countries with more favourable policies of access to social security, or where the length of ban from the labour market is shorter. In the next section we investigate whether these relationships hold when introducing controls and fixed effects, and also take into account the potential endogeneity where we use lagged controls.

[20] It is important to note that this indicator measures changes in policy, related to access to social protection, relative to the baseline during that period.

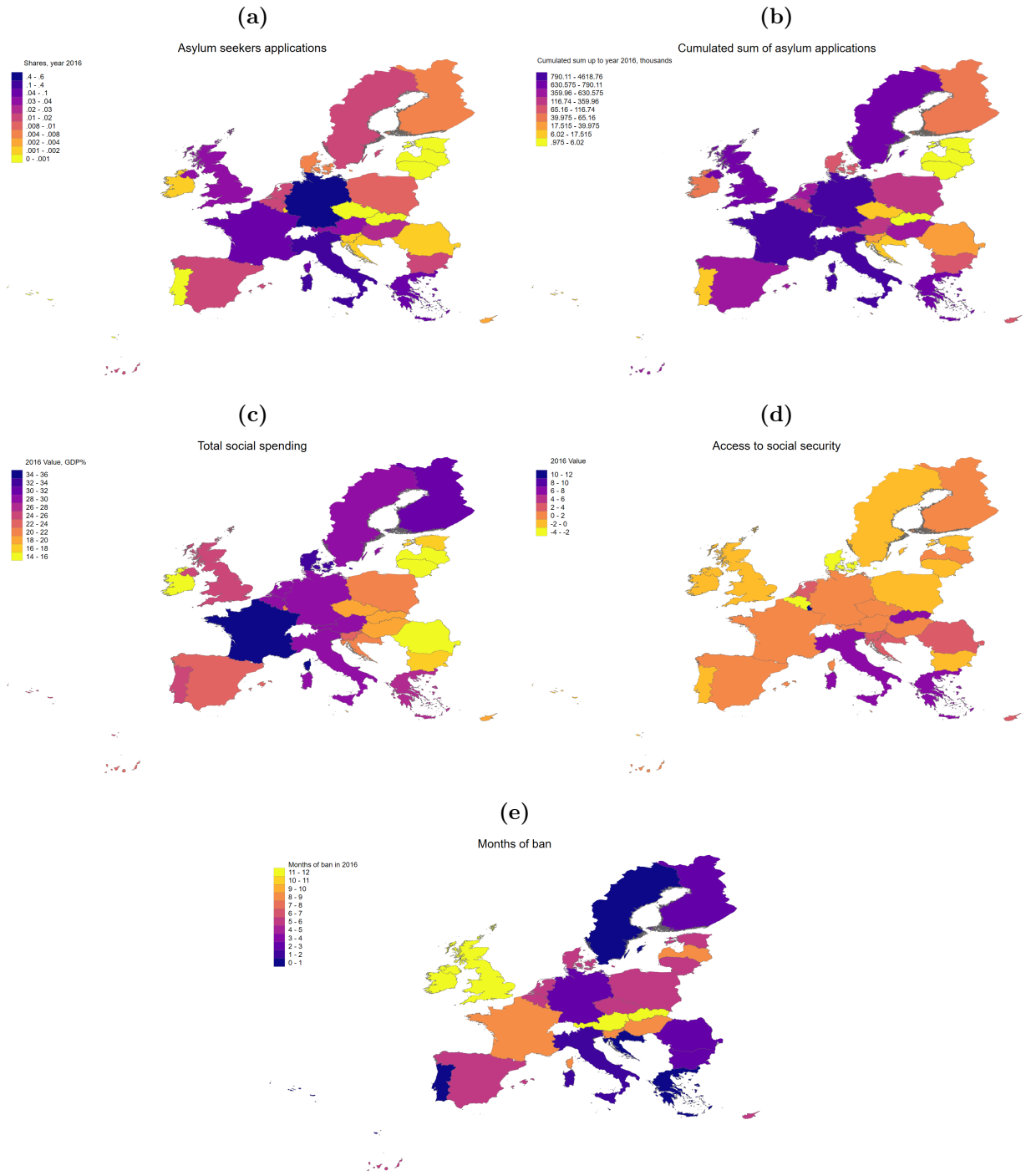
[21] The average value for France is explained by the fact that in 2018 the ban was reduced from 9 to 6 months.

Table 2: Average values for the five top destinations for first time asylum applications, 2015-2019

	Country				
Variable	Germany	France	Italy	Sweden	UK
Asylum applications (quarterly mean per dyad)	948.71	276.39	413.84	144.82	132.25
Cumulative sum of asylum applications (quarterly mean per dyad)	13225.92	4872.112	7143.385	2661.3	2971.797
Total social spending (GDP %, mean)	29.77	33.99	29.03	28.60	26.34
Access to social security (mean)	0.32	0.27	8.26	0.39	-1.58
Months of ban (mean)	3	7.76	2	0	12
Recognition rate (mean)	18.36	23.54	38.05	13.16	21.53
Processing time (months, mean)	8.59	5.48	0.61	8.19	5.36
Repatriation risk (mean)	0.92	2.77	4.94	1.36	19.24

Source: Authors' calculations based EUROSTAT (2021a), years 2008-2020; DEMIG-Quantmig data, years 2007-2019; Eurostat data on social spending, years 2007-2019. **Notes:** The table shows the average values for the time period 2015-2019.

Figure 4: Heatmaps for the EU of the main variables in 2016



Source: Authors' calculations based on EUROSTAT (2021a), Eurostat data on social spending, and DEMIG-Quantmig data.
Notes: The graph is based on the countries' values for the year 2016.

3 Empirical Analysis

3.1 Empirical Methodology

Following the literature on the determinants of international migration, we estimate a gravity model which is underpinned by a Random Utility Model (RUM). In this framework, an individual's locational decision is based on a utility maximisation problem where income is maximised and migration costs are minimised. We extend and augment the traditional gravity model by including drivers that are specific to asylum seekers. More specifically, we include destination pull factors related to the welfare generosity, policies related to employment rights, the asylum applications' process, and networks, all of which would potentially affect utility maximisation. Thus, we expect that more generous welfare systems, favourable access to the labour market, shorter processing time and likelihood of positive outcomes (recognition rate) and larger networks to be positively associated with asylum applications. We estimate below the role of these destination pull factors and more importantly aim to measure the importance of these drivers especially that asylum seekers, unlike economic migrants, might not be driven in terms of destination choice, primarily by economic factors. It is important to note that we do not aim to quantify the role of the different push factors driving asylum seekers to emigrate, as we acknowledge that war and conflict are the main push factors, but we introduce origin-time fixed effects to capture all country of origin related push factors.

We estimate the following equation of the determinants of first time asylum applications in the EU:

$$\begin{aligned} Asylum\_appl_{o,d,t} =& \alpha_{o,d} + \beta_1 ln(GDP)_{d,t-4} + \beta_2 Unempl_{d,t-4} + \beta_3 X_{d,o} \\ &+ \beta_4 Soc\_spend_{d,t-4} + \beta_5 Acc\_soc\_sec_{d,t-4} + \beta_6 Months\_ban(ln)_{d,t-4} \\ &+ \beta_7 Cum\_sum\_asy\_appl(ln)_{d,t-4} + \beta_8 Recognition_{d,o,t} \\ &+ \beta_9 Processing\_time(ln)_{d,o,t} + \beta_{10} Repatriation_{d,o,t} \\ &+ \beta_{11} Recognition_* Processing_{d,o,t} + \gamma_y + \delta_{o,y} + \epsilon_{o,d,t} \end{aligned} \tag{1}$$

where the dependent variable is the number of first time asylum applications from citizens of country o to destination d in quarter year t. To ensure that we minimise the potential reverse causality between our dependent variable and independent variables, we lag most of our variables as follows. We include the traditional gravity variables, namely, $ln(GDP)$ and $Unemployment$, lagged four time (quarter year) periods; i.e. one year, and $X_{d,o}$ which is a vector of time-invariant dyadic dummy variables: common language, colonial ties, and contiguity. We also include the distance (in ln) between the capital cities of the two considered countries. To capture the welfare generosity we include $Soc\_spending$ that measures the total social spending in destination d, as a % of GDP, and policy changes in asylum seekers' access to social protection, Acc_soc_sec, in destination. Both welfare variables are lagged one year (four quarters $t-4$). We also include $Months\_ban(ln)$ which is the (ln) number of months of ban from access to the labour market in destination d lagged four quarters, $t-4$. To

capture social networks we use the cumulative sum (ln) of asylum applications from citizens of country o in destination d measured from the first quarter of the analysis in 2008 up to a year $(t-4)$ before. We also use an extensive set of different measures of social networks as a robustness below. Finally, we include the three measures of the asylum applications' process: *Processing Time, Recognition rate, Repatriation Risk* and we also interact the *Recognition rate* with the *Processing time* to pick the effect of the waiting time for successful outcomes. Following Bertoli et al. (2022) we do not lag these controls to proxy destination countries asylum policies (*Recognition_rate*, *Processing_time*, *Repatriation_risk*) as all of them include earlier asylum applications and introducing a lag could lead to mechanical correlations with the dependent variable.

One of the empirical challenges of our estimation is the presence of zeros in the dependent variable that could lead to biased estimations when using an OLS model. This is particularly relevant for our analysis as the zeros observations constitute about the 26% of our sample. Following Silva and Tenreyro (2006) we estimate equation (1) using Poisson Pseudo Maximum Likelihood (PPML) with high dimensional fixed effects, but we also show the estimates using OLS (ln+1). The second empirical challenge is the potential presence of multilateral resistance to migration, which refers to the potential presence of additional confounding factors due to the attractiveness of alternative destinations. This influences bilateral migration flows and may bias the coefficients of interest if ignored (Bertoli and Fernández-Huertas Moraga, 2013). We follow Ortega and Peri (2013) and mitigate the potential bias arising from multilateral resistance by adding origin-year fixed effects δ_{oy}.[22] This also has the advantage of controlling for all time-variant push factors at origin such as GDP and unemployment, conflicts, and political uprisings in origin. This allows us to concentrate on the destination drivers as it is well established in the literature that asylum flows are first driven to leave their origin due to war and conflict, see for example Hatton (2004); Giménez-Gémez et al. (2019) whilst the pull drivers of where they go to, which is our focus, is less understood. We also include year (y) fixed effects, γ_y to control for shocks affecting all EU destinations as well as any common EU policy changes.[23]

3.2 Main Results

First, we present the estimates using OLS where our dependent variable is (ln +1) of the number of first time asylum applications from citizens of country o to destination d in a quarter year t, in Table 3.[24] In Column 1 we only include the traditional gravity variables, capturing the economic and geographical pull factors, and the asylum applications' process

[22] See Beine et al. (2016) for a discussion on multilateral resistance of migration and ways to potentially control for this.

[23] There is a Common European Asylum System (CEAS) which sets out common standards and cooperation to ensure that asylum seekers are treated fairly and equally in all EU member states which was set in 2008 followed by a number of proposed reforms that were partially implemented. Importantly, though in 2015 due to the unprecedented flow of asylum seekers, cracks emerged in the implementation of the CEAS. See https://home-affairs.ec.europa.eu/policies/migration-and-asylum/common-european-asylum-system$_en$.

[24] In Table 5, Column 1, we estimate our model using the OLS and transform our dependent variable using Inverse Hyperbolic Sine (IHS) given the presence of zeros as an alternative specification, see (MacKinnon and Magee, 1990). The estimates are consistent with the ones using OLS (ln+1) in Table 3.

measures. From Column 2 to Column 6 we add our main variables of interest. The Table shows that all the controls have the expected sign. In particular, recognition rate is positive and significant but repatriation risk is not significant. Processing time is negative and significant. Social spending and access to social security show a positive and significant coefficient, while months of ban is negative and statistically significant at the 10% level in Columns 4, non-significant in Column 5 when we control for access to social security, and becomes significant at the 1% level in Column 6 where we also control for social networks. The cumulative sum of asylum applications shows a positive and significant coefficient, and the magnitude is much larger than the other variables.

Table 4 shows the results of the PPML estimation which is our preferred specification. The results are presented in the same way as in Table 3. Also in this case the controls show the expected sign and are consistent with the OLS estimates.[25] Consistent with Table 3, total social spending and access to social security are positively and significantly correlated with our dependent variable. In Column 6, when we include the cumulative sum of asylum applications our measure of social networks, the magnitude of the coefficients of the other focal variables decrease. The PPML estimation supports the OLS results on social networks, since the cumulative sum of asylum applications has a positive and significant coefficient, and the magnitude is larger than total social spending and access to social security. In this specification, Table 4, months of ban from the labour market are always negatively correlated with the number of asylum application received. However, when we include all controls, the magnitude of the coefficient is smaller than the positive effect of social networks.[26] Also recognition rate and the interaction between recognition rate and processing time show a much smaller magnitude than social networks.[27] Moreover, the results suggest that, although social spending and destination countries' policies aimed at attracting/deterring new asylum applications are significantly correlated with the asylum seekers' inflows, social networks have a much stronger influence and are the main determinant in attracting new asylum applications.

[25]The only exception is GDP per capita which has a negative sign from Column 2. This is common in gravity model estimates as sometimes GDP per capita at destination is highly correlated with other economic conditions and unemployment at destination, see for example Bertoli et al. (2016) who also find negative GDP per capita coefficient. In Table A.2 Column 4 we drop GDP per capita as a check and our estimates are robust. We indeed find that the coefficient of unemployment becomes -0.62 and picks the full impact of economic conditions increasing by over 7 times as much, and becomes similar in magnitude to the size of the coefficient of GDP per capita.

[26]In Table A.2, Column 2, we exclude those country for which we don't have information on the months of ban, and where we use processing duration to proxy for month of ban. Our results are consistent.

[27]In Table A.2, Column 3, we exclude those observations that have values of repatriation risk greater than 100, and all our results hold.

Table 3: Determinants of asylum applications to the EU, 2008-2020, OLS estimates

	(1) Asy. app (1+ln)	(2) Asy. app (1+ln)	(3) Asy. app (1+ln)	(4) Asy. app (1+ln)	(5) Asy. app (1+ln)	(6) Asy. app (1+ln)
Real GDP per capita (ln, t-4)	1.248***	0.202	0.169	0.188	0.159	0.0197
	(0.248)	(0.176)	(0.193)	(0.175)	(0.192)	(0.106)
Unemployment (%, t-4)	-0.0394***	-0.0449***	-0.0495***	-0.0458***	-0.0501***	-0.0437***
	(0.0105)	(0.00989)	(0.0102)	(0.00991)	(0.0102)	(0.00560)
Contiguity	-1.807***	-1.440***	-1.385***	-1.472***	-1.412***	-0.376**
	(0.429)	(0.354)	(0.353)	(0.353)	(0.353)	(0.179)
Common language	0.424**	0.663***	0.722***	0.689***	0.739***	0.341***
	(0.144)	(0.155)	(0.164)	(0.159)	(0.167)	(0.0794)
Colony ties	1.244***	0.879***	0.913***	0.913***	0.938***	0.339***
	(0.168)	(0.185)	(0.193)	(0.187)	(0.195)	(0.0959)
Distance between capitals (ln)	-0.194	-0.569**	-0.401*	-0.562**	-0.402*	-0.0667
	(0.235)	(0.222)	(0.230)	(0.222)	(0.230)	(0.114)
Recognition rate (%)	0.0152***	0.0130***	0.0128***	0.0131***	0.0128***	0.00701***
	(0.00115)	(0.00112)	(0.00111)	(0.00112)	(0.00111)	(0.000632)
Processing time (ln)	-0.388***	-0.292***	-0.297***	-0.291***	-0.296***	-0.0331
	(0.0238)	(0.0210)	(0.0212)	(0.0209)	(0.0212)	(0.0205)
Recognition*Processing	-0.00137*	-0.00169**	-0.00160**	-0.00175**	-0.00166**	-0.00211***
	(0.000704)	(0.000650)	(0.000649)	(0.000652)	(0.000651)	(0.000599)
Repatriation risk	0.000339	0.000424	0.000811	0.000600	0.000931	-0.000258
	(0.000955)	(0.000933)	(0.000976)	(0.000930)	(0.000972)	(0.000672)
Total social spending (% GDP, t-4)		0.139***	0.143***	0.139***	0.143***	0.0697***
		(0.0110)	(0.0113)	(0.0111)	(0.0113)	(0.00592)
Access to social security (t-4)			0.0662***		0.0637***	0.0391***
			(0.0186)		(0.0187)	(0.0100)
Months of ban (ln, t-4)				-0.0820*	-0.0628	-0.0614**
				(0.0485)	(0.0496)	(0.0248)
Cumulative sum asy. appl (ln, t-4)						0.543***
						(0.0118)
Origin*year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27476	27476	27476	27476	27476	27476
R-squared	0.438	0.493	0.496	0.493	0.497	0.690

Notes: Standard errors clustered at the country-pair level in parentheses. * $p < 0.10$, **$p < 0.05$, *** $p < 0.001$. **Source:** Authors' calculations based on EUROSTAT (2021a), years 2008-2020.

Table 4: Determinants of asylum applications to the EU, 2008-2020, PPML estimates

	(1) Asylum app	(2) Asylum app	(3) Asylum app	(4) Asylum app	(5) Asylum app	(6) Asylum app
Real GDP per capita (ln, t-4)	0.383	-0.408	-0.708*	-0.535	-0.763*	-0.689**
	(0.306)	(0.403)	(0.425)	(0.447)	(0.450)	(0.216)
Unemployment (%, t-4)	-0.116*	-0.155*	-0.196**	-0.171*	-0.209**	-0.0816***
	(0.0606)	(0.0797)	(0.0913)	(0.0894)	(0.0969)	(0.0165)
Contiguity	-3.340***	-3.192***	-2.829***	-3.328***	-2.990***	-1.349***
	(0.702)	(0.596)	(0.606)	(0.593)	(0.597)	(0.254)
Common language	0.0940	0.135*	0.157*	0.115	0.136*	0.0383
	(0.0793)	(0.0787)	(0.0815)	(0.0778)	(0.0806)	(0.0513)
Colony ties	0.715**	0.531	0.663	0.692*	0.820**	0.287**
	(0.311)	(0.357)	(0.417)	(0.356)	(0.413)	(0.139)
Distance between capitals (ln)	-0.814*	-1.207**	-0.666	-1.136**	-0.630	-0.132
	(0.436)	(0.460)	(0.444)	(0.456)	(0.443)	(0.202)
Recognition rate (%)	0.0116***	0.0106***	0.0100***	0.0108***	0.00997***	0.00563***
	(0.00253)	(0.00289)	(0.00279)	(0.00292)	(0.00277)	(0.00167)
Processing time (ln)	-0.330***	-0.261***	-0.278***	-0.261***	-0.280***	-0.0305
	(0.0389)	(0.0465)	(0.0446)	(0.0478)	(0.0456)	(0.0486)
Recognition*Processing	-0.000351	-0.000641	-0.000525	-0.000944	-0.000783	-0.000678
	(0.000965)	(0.00103)	(0.00105)	(0.00107)	(0.00108)	(0.00120)
Repatriation risk	-0.000108	0.000951	0.000434	0.00167	0.00110	0.00242
	(0.00372)	(0.00355)	(0.00368)	(0.00339)	(0.00352)	(0.00148)
Total social spending (% GDP, t-4)		0.0897***	0.112***	0.0948***	0.115***	0.0391***
		(0.0242)	(0.0305)	(0.0277)	(0.0327)	(0.0112)
Access to social security (t-4)			0.161***		0.159***	0.0847***
			(0.0403)		(0.0403)	(0.0153)
Months of ban (ln, t-4)				-0.221***	-0.208**	-0.184***
				(0.0633)	(0.0685)	(0.0332)
Cumulative sum asy. appl (ln, t-4)						0.655***
						(0.0205)
Origin*year FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27476	27476	27476	27476	27476	27476
Pseudo R-squared	0.535	0.549	0.555	0.555	0.555	0.574

Notes: Standard errors clustered at the country-pair level in parentheses. * $p < 0.10$, **$p < 0.05$, *** $p < 0.001$. **Source:** Authors' calculations based on EUROSTAT (2021a), years 2008-2020.

3.3 Alternative Measures and Robustness

To check the robustness of our results we estimate a number of alternative specifications and use different measures to capture our main variables of interest. We use an extensive set of measures to capture social networks based on both previous asylum seekers as well as migrant stock. We also check the robustness of our results using different measures of social spending, and months of employment ban/employment rights.

3.3.1 Sub-Samples: EU15 Destinations and Main Origin Countries

First, we examine the role of these drivers for EU15 in particular and in the period where the inflows of asylum seekers peaked. In Table 5 Column 3 we restrict the sample to the EU15 destinations. In Column 4 we only include the period 2015-2020. In Column 5 we only have the EU15 destinations in the period 2015-2020. In all cases, the sign and magnitude of social networks is always consistent. Also months of ban and access to social protection show the expected sign and significance level, while total social spending becomes non-significant when we restrict the sample to EU15 destinations only. Interestingly, this might suggest that within EU15, there is no significant difference in terms of social spending as a pull factor. However, also the coefficient on month of ban is reduced and the role of social networks becomes even more prominent when looking at EU15 as a destination choice between 2015-2020 suggesting the strong association between previous asylum flows and first time asylum applications is prominent for EU15.

In addition, we also check the robustness of our estimates to excluding Syrian asylum seekers as this group has had higher recognition rate in some destinations for example in Sweden, see Table 5 Column 6. We also conduct a final check in Table 5 Column 7 where we limit our analysis to asylum seekers from the top 10 countries of origin. Both exercises confirm our previous results and underscore the strong association between social networks and asylum applications.

3.3.2 Asylum Shares

In Table 5, Columns 1 and 2 we consider two alternative measures of our dependent variable. First, we use *Asylum Applications (%)* which is first time asylum applications from citizens of country o to destination d as a share of the total number of first time asylum applications from citizens of country o in all EU countries at time t. This variable measures the relative share of first time asylum applicants from origin o who are in destination d; e.g.. the share of first time asylum applicants from Syria in Germany relative to the total first time asylum applicants from Syria in the EU, at time t. In Table A.1 we present descriptive statistics for this dependent variable. The Table shows that the quarter yearly average share of first time asylum application per dyad is around 1 percent. The average share is quite low due to the presence of zeroes where there are no first time asylum seekers from origin in destination in some/all quarters (corresponding to the 26% of our total observations). Although the maximum is equal to 100, we have very few observations where this value is above 40 (only 16). As an example, the value for Syrians to Germany in the first quarter of 2016 is equal to 38%. The second alternative measure of the dependent variable we use

is *Asylum Applications/pop (%)* which is the percentage of first time asylum applications from citizens of country o to destination d over the population size of country o at time t. This measure is similar in essence to an emigration rate, though of course here it only captures the emigration of first time asylum seekers, and allows us to view our results as not being conditional on being a first time asylum applicant in the EU. In Table 5 we present the PPML estimates using these two alternative dependent variables. In Column 1 we use *Asylum Applications (%)* and *Asylum Applications/pop (%)* in Column 2. In both cases the results confirm the findings of our previous analysis.

3.3.3 Social Network Measures

In Table 6 we test the robustness of our results by using alternative measures to proxy social networks. We first follow the literature and use migrant stocks, see for example Beine et al. (2011). In Columns 1 and 2 we use the stocks of migrants from origin o in destination d five years earlier. In Column 1 we use total migration stocks by nationality based on OECD data[28], and in Column 2 we use data on migration stocks by citizenship from Eurostat.[29] As Table 1 shows the two values of average stock per dyad are similar in size taking into account that the Eurostat data excludes some countries.[30] In Table 6, Column 3 we use data from UNDESA which are only available every 5 years, therefore we have less time variability in this specification. In Column 4 we use UNDESA data, but impute a linear growth for the missing years.[31] For all three social network measures we have a smaller sample due to the sparse data on bilateral migration stocks.[32] We also use alternative social network measures using inflow data, which we are also aware might be more likely to suffer from endogeneity. Hence, we use lags of different length but we also interpret all our results as correlations. In Table 6, Column 5 we use the number of asylum applications in the previous year preceding the quarter of interest [33], while in Column 6 we lag the cumulative number of asylum applications up to 3 years before the quarter of interest (up to t-12). In Columns 6 and 7 we use total migrant inflows by nationality based on OECD data.[34] In Column 6 we use the cumulative sum up to one year before the quarter of interest and in Column 7 the cumulative sum up to three years before the quarter of interest. The results on social networks are similar to the baseline analysis and we find a similar magnitude for the coefficients. On the other hand, total social spending and months of ban from labour market are not always significant suggesting their relative smaller role when controlling for social networks. It is also important to underscore that our findings show that social networks are important determinant for asylum applicants' destination more so than other factors, and that where previous asylum seekers went is more correlated (even more than migrant stock) with where the new asylum applicants will go.

[28] OECD.Stat (2021b).
[29] EUROSTAT (2021b).
[30] The main difference between the two data sources is that Eurostat does not have information on France, which is one of the top 5 destinations for asylum seekers.
[31] UNDESA (2021).
[32] This is one of main reasons why we don't include this control in our baseline estimations.
[33] Therefore between quarters t-8 and t-5.
[34] OECD.Stat (2021a).

3.3.4 Employment and Welfare Policies

In Columns 1 and 2 of Table 7 we use alternative measures to proxy the length of ban from employment/access to the labour market for asylum seekers. In Column 1 we use a dummy variable that takes the value 1 if the destination country does not impose any length of employment ban. In this case, the coefficient is only significant at the 10% level, while the coefficient of the other focal variables, and in particular our proxy for social networks, are similar to our baseline results. In Column 2 we proxy the length of ban with a dummy that takes the value 1 if the ban imposed by the destination country lasts up to three months. In this case, all the coefficients are consistent with our baseline results. The different measures of employment ban is consistently much smaller in magnitude and significance compared to the role of social networks. Finally, in order to capture whether asylum seekers are forward looking and take into account future employment probability if successful in gaining refuge in the destination, in Column 3 we include as a control the share of employed refugees who have between 1 and 5 years of residence in the destination country. We build this variable using the 2008 and 2014 *ad hoc* modules of the EU LFS which allows us to compute the number of refugees from country o resident in destination d who reported being employed over the total number of refugees from country o resident in destination d.[35] The variable is expressed in percentage. We find that this has a positive correlation but the size of the coefficient is very small suggesting little association.

In Table 8 we use alternative measures of access to social protection and labour market. We use data from the Migrant Integration Policy Index (MIPEX), which is a composite index that measures policies to integrate migrants for a number of countries, including the EU ones. We include in the analysis 2 indicators from MIPEX.[36] These are access to social security, which we use as an alternative to our index of access to social protection, and access to labour market which substitutes the months of ban. These indicators measure which categories of foreign residents have the same access to employment or social security as nationals. The categories of foreigners included are permanent residents, residents on temporary work permits, and residents on family reunion permits. These indicators can score 0, 50, or 100 depending on how many among the above mentioned categories of foreigners (none, only some, or all) are treated in the same way as natives in terms of access to labour market or social security. A caveat of these indices is that they are not targeted for asylum seekers specifically, but measure access to social security and labour market of all foreigners. However, even when using these two MIPEX Policy Indices, the results are consistent with our baseline estimates. The MIPEX access to the labour market measure shows a positive and statistically significant coefficient only in Column 2, where we do not control for access to social security. In Column 3, where we include for both indices, only access to social security is positive and statistically significant. Also, the coefficients of social networks are still significantly larger than those of these two MIPEX indices.

Finally, in Table 9 we use alternative measures for total social spending. In Column 1 and 2 we use different time lags (3 and 5 years respectively), while in Column 3 we use total social spending per capita (in PPP) rather than as a percentage of GDP. As for the baseline

[35] Eurostat (2020).

[36] See Solano and Huddleston (2020).

specification, we use a one-year lag. These estimates are also consistent with our baseline findings. Overall, using different measures confirms our baseline and show the findings are robust to alternative definitions and measures.

Table 5: Determinants of asylum applications to the EU, 2008-2020, alternative samples and measures of dependent variable, PPML estimates

	(1) Asylum app (%)	(2) Asylum app/pop (%)	(3) Asylum app	(4) Asylum app	(5) Asylum app	(6) Asylum app	(7) Asylum app
Recognition rate (%)	0.00452***	0.00475**	0.00299**	0.00695**	0.00318	0.00426**	0.00801***
	(0.000913)	(0.00166)	(0.00146)	(0.00219)	(0.00219)	(0.00132)	(0.00221)
Processing time (ln)	-0.0152	0.0489	0.0579*	0.00583	-0.0180	-0.0320	-0.0697
	(0.0249)	(0.0350)	(0.0300)	(0.0411)	(0.0508)	(0.0435)	(0.0809)
Recognition*Processing	-0.000843	-0.0120*	-0.00929*	-0.000442	0.00310	-0.00438	-0.0115
	(0.00267)	(0.00727)	(0.00554)	(0.00400)	(0.00394)	(0.00593)	(0.0107)
Repatriation risk	0.000225	0.00127	-0.00168	0.00277**	-0.00287	-0.000526	0.00325**
	(0.000469)	(0.00138)	(0.00111)	(0.00114)	(0.00247)	(0.000740)	(0.00130)
Total social spending (% GDP, t-4)	0.0323***	0.0521***	-0.000235	0.0419**	0.00253	0.0401***	0.0696**
	(0.00712)	(0.0129)	(0.0138)	(0.0146)	(0.0156)	(0.00883)	(0.0281)
Access to social security (t-4)	0.0674***	0.0711***	0.108***	0.0869***	0.104***	0.0783***	0.118***
	(0.00816)	(0.0177)	(0.0206)	(0.0173)	(0.0227)	(0.0126)	(0.0295)
Months of ban	-0.0503**	-0.114**	-0.183***	-0.143**	-0.113**	-0.129***	-0.287***
	(0.0233)	(0.0386)	(0.0334)	(0.0542)	(0.0459)	(0.0317)	(0.0550)
Cumulative sum as. appl (ln, t-4)	0.560***	0.639***	0.615***	0.692***	0.653***	0.653***	0.614***
	(0.0147)	(0.0250)	(0.0328)	(0.0329)	(0.0454)	(0.0162)	(0.0468)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Origin*year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27474	27180	24617	13197	12069	27028	5218
R-squared	0.491	0.295	0.835	0.816	0.836	0.794	0.775

Notes: Col (1) the dependent variable is Asylum Application Share. Col(2) the dependent variable is Asylum Application/Origin population Share. Col (3) only includes EU15 destinations. Col (4) only includes the period 2015-2020. Column (5) only includes EU 15 destinations and the period 2015-2020. Column (6) excludes Syria as possible country of origin. Column (7) only includes the top 10 countries of origin. Standard errors clustered at the country-pair level in parentheses. * $p < 0.10$, **$p < 0.05$, *** $p < 0.001$. **Source:** Authors' calculations based on EUROSTAT (2021a), years 2008-2020.

Table 6: Determinants of asylum applications to the EU, 2008-2020, different measures of social networks, PPML estimates

	(1) Asylum app	(2) Asylum app	(3) Asylum app	(4) Asylum app	(5) Asylum app	(6) Asylum app	(7) Asylum app	(8) Asylum app
Recognition rate (%)	0.00432**	-0.00160	0.00623**	0.00709**	0.00685**	0.00601***	0.00277	0.00470**
	(0.00198)	(0.00277)	(0.00290)	(0.00277)	(0.00229)	(0.00165)	(0.00211)	(0.00205)
Processing time (ln)	-0.205***	-0.282**	-0.238***	-0.271***	0.0335	-0.105*	-0.165***	-0.267***
	(0.0608)	(0.0856)	(0.0704)	(0.0721)	(0.0502)	(0.0581)	(0.0431)	(0.0497)
Recognition*Processing	-0.000858	-0.000838	0.000259	0.000211	0.00227	-0.000952	0.000189	-0.000662
	(0.00124)	(0.00228)	(0.00116)	(0.00111)	(0.00198)	(0.00108)	(0.00115)	(0.000867)
Repatriation risk	0.00102	0.000543	0.00298	0.00247	0.00386**	0.00173	0.000885	0.0000488
	(0.00153)	(0.00150)	(0.00299)	(0.00325)	(0.00195)	(0.00120)	(0.00213)	(0.00187)
Total social spending (% GDP, t-4)	0.0205	-0.0147	0.0496*	0.0489*	0.0359**	0.0383***	0.0415*	0.0347
	(0.0264)	(0.0256)	(0.0277)	(0.0270)	(0.0143)	(0.0108)	(0.0219)	(0.0231)
Access to social security (t-4)	0.177***	0.211***	0.162***	0.150***	0.0647***	0.0827***	0.116***	0.125***
	(0.0238)	(0.0233)	(0.0347)	(0.0331)	(0.0187)	(0.0147)	(0.0236)	(0.0250)
Months of ban (ln, t-4)	-0.155**	-0.213***	-0.0717	-0.102	0.0131	-0.170***	-0.0146	0.00620
	(0.0534)	(0.0574)	(0.0758)	(0.0719)	(0.0613)	(0.0329)	(0.0481)	(0.0507)
Stocks (1+ln, t-20, OECD)	0.600***							
	(0.0449)							
Stocks (1+ln, t-20, Eurostat)		0.568***						
		(0.0327)						
Stocks (1+ln, t-20, UNDESA)			0.606***					
			(0.0632)					
Stocks (1+ln, t-20, UNDESA, middle point)				0.507***				
				(0.0742)				
Asy. appl previous year (ln, t-8 - t-5)					0.766***			
					(0.0339)			
Cumulative sum asy. appl (ln, t-12)						0.658***		
						(0.0187)		
Cumulative sum inflows (ln, t-4, OECD)							0.546***	
							(0.0570)	
Cumulative sum inflows (ln, t-12, OECD)								0.510***
								(0.0601)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Origin*year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19570	16709	19750	20463	25326	25326	26613	24463
R-squared	0.766	0.786	0.740	0.709	0.818	0.820	0.747	0.732

Notes: Standard errors clustered at the country-pair level in parentheses. * $p < 0.10$, **$p < 0.05$, *** $p < 0.001$. **Source:** Authors' calculations based on EUROSTAT (2021a), years 2008-2020.

Table 7: Determinants of asylum applications to the EU, 2008-2020, different measures for access to labour market, PPML estimates

	(1) Asylum app	(2) Asylum app	(3) Asylum app
Recognition rate (%)	0.00557***	0.00507***	0.00529***
	(0.00161)	(0.00142)	(0.00153)
Processing time (ln)	-0.0104	-0.0332	-0.00460
	(0.0423)	(0.0438)	(0.0433)
Recognition*Processing	-0.00945	-0.00838	-0.0101
	(0.00658)	(0.00724)	(0.00651)
Repatriation risk	0.00189	0.00235*	0.00214*
	(0.00134)	(0.00125)	(0.00126)
Total social spending (% GDP, t-4)	0.0315***	0.0356***	0.0356***
	(0.00931)	(0.0101)	(0.0103)
Access to social security (t-4)	0.0949***	0.0619***	0.0742***
	(0.0147)	(0.0129)	(0.0136)
No ban	0.141*		
	(0.0743)		
Up to 3 months ban		0.448***	
		(0.0807)	
Months of ban (ln, t-4)			-0.174***
			(0.0319)
Employed refugees (%, up to 5 years, t-4)			0.00444**
			(0.00218)
Cumulative sum asy. appl (ln, t-4)	0.674***	0.665***	0.669***
	(0.0177)	(0.0185)	(0.0191)
Controls	Yes	Yes	Yes
Origin*year FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	27476	27476	27476
Pseudo R-squared	0.822	0.827	0.825

Notes: Standard errors clustered at the country-pair level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$. **Source:** Authors' calculations based on EUROSTAT (2021a), years 2008-2020.

Table 8: Determinants of asylum applications to the EU, 2008-2020, MIPEX indices, PPML estimates

	(1) Asylum app	(2) Asylum app	(3) Asylum app
Recognition rate (%)	0.00636***	0.00542**	0.00576***
	(0.00171)	(0.00181)	(0.00169)
Processing time (ln)	0.0497	0.00419	0.0553
	(0.0412)	(0.0453)	(0.0415)
Recognition*Processing	-0.0121	-0.0116	-0.0118*
	(0.00746)	(0.00823)	(0.00716)
Repatriation risk	0.000760	0.000739	0.000886
	(0.00124)	(0.00140)	(0.00130)
Total social spending (% GDP, t-4)	0.00433	0.0332**	0.00618
	(0.00947)	(0.0115)	(0.00988)
Access to social security (MIPEX, t-4)	0.00752***		0.00737***
	(0.00131)		(0.00127)
Access to labour market (MIPEX, t-4)		0.00449**	0.00259
		(0.00200)	(0.00164)
Cumulative sum asy. appl (ln, t-4)	0.587***	0.647***	0.585***
	(0.0370)	(0.0301)	(0.0374)
Controls	Yes	Yes	Yes
Origin*year FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	26625	26625	26625
R-squared	0.816	0.807	0.816

Notes: Standard errors clustered at the country-pair level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$. **Source:** Authors' calculations based on EUROSTAT (2021a), years 2008-2020.

Table 9: Determinants of asylum applications to the EU, 2008-2020, different measures of social spending, PPML estimates

	(1) Asylum app	(2) Asylum app	(3) Asylum app
Recognition rate (%)	0.00568***	0.00552***	0.00510***
	(0.00155)	(0.00157)	(0.00154)
Processing time (ln)	-0.0321	-0.0224	-0.0321
	(0.0480)	(0.0486)	(0.0492)
Recognition*Processing	-0.000676	-0.000781	-0.000739
	(0.00114)	(0.00115)	(0.00116)
Repatriation risk	0.00205	0.00211*	0.00223*
	(0.00126)	(0.00125)	(0.00126)
Access to social security (t-4)	0.0850***	0.0872***	0.0778***
	(0.0145)	(0.0150)	(0.0147)
Months of ban (ln, t-4)	-0.176***	-0.193***	-0.204***
	(0.0311)	(0.0328)	(0.0364)
Cumulative sum asy. appl (ln, t-4)	0.679***	0.673***	0.664***
	(0.0173)	(0.0180)	(0.0189)
Total social spending (% GDP, t-12)	0.0296**		
	(0.00981)		
Total social spending (% GDP, t-20)		0.0454***	
		(0.0112)	
Total social spending pc (PPP, ln, t-4)			1.503***
			(0.337)
Controls	Yes	Yes	Yes
Origin*year FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	27476	27476	27476
Pseudo R-squared	0.824	0.825	0.827

Notes: Standard errors clustered at the country-pair level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$. **Source:** Authors' calculations based on EUROSTAT (2021a), years 2008-2020.

3.4 Discussion

It is important to quantify the magnitude of our estimates. Based on our preferred estimates Table 4, Column 6, it is clear that social networks measured by cumulative sum of previous asylum applications has the largest correlation. A one percent increase in cumulative sum of previous asylum applications is associated with 0.66% increase in first time asylum applications, while a one percent reduction in the length of ban is associated with 0.18% increase in first time asylum applications. Similarly, evaluated at the mean, a one percent increase in total social spending (as a percent of GDP) is associated with 0.14% increase in first time asylum applications. In other words, cumulative sum of previous asylum applications is four times larger than the impact of the employment ban and five times larger than social spending. Although these estimates should be interpreted as capturing location decisions conditional on migration to the EU, when we look at the shares of asylum applicants as a percent of origin population in Table 5, the coefficients are very similar in magnitude as the ones in Table 4, Column 6. Also, all our robustness checks suggest similar magnitudes for the associations between those factors using alternative measures and our dependent variable.

Another important aspect worth highlighting is that although all the different measures of social networks are similar in magnitude, as Table 6 shows, asylum applications in the previous year has the largest elasticity (0.77%). In a way this underscores that destination choice of asylum applicants is to a large extent driven by recent previous asylum flows. This might be due to social networks transmitting information about routes and destinations or helping friends and families to join them.

Focusing on the magnitude of asylum applications with respect to employment ban/rights in destination, based on Table 7, Column 1 estimates, a policy allowing access to the labour market to asylum applicants on arrival; i.e. no ban, would lead to 25 more applications (per dyad and per quarter year). Given the cost and detrimental impact of lack of access to the labour market, these estimates hardly justify such a ban and support calls for lifting the ban.[37] Overall, our findings suggest that the association between employment ban or welfare system and the flow of asylum applications is rather modest in magnitude. The main pull factor is social networks, and in particular recent previous asylum applications.

4 Conclusion

The recent so called Mediterranean refugee crisis has presented a serious challenge for EU countries. On one hand, on a humanitarian level, the flows of asylum seekers have been welcomed by some, while others have been concerned about the burden and the potential cost of hosting those refugees. Images of families and children in boats risking their lives to cross the Mediterranean sea and then struggling to reach their intended destination, have haunted the public. However, despite this public interest and concern, there is little empirical evidence on the determinants of the destination of refugees. In other words, what drives

[37] See calls for lifting the ban on asylum seekers' employment by Fasani et al. (2021a) who estimate a €37.6 billion output loss from the bans imposed on asylum seekers who arrived in Europe during 2015 Med refugee crisis. Also, the UK Migration Advisory Committee in their Annual report of 2021 has recommended a review of the ban policy in the UK and expressed concerns about the implications of such a ban.

asylum seekers to apply for asylum in particular destinations? Is it the economic conditions in the destination? Is it the generous welfare system? Is it the quick processing time of applications? Is it because they can work sooner rather than later and earn a living? Or is it because their networks are there? These are the questions this paper aims to answer.

This paper examines the determinants of the destination choice of first time non-EU asylum seeker applicants to the EU, between 2008-2020. The paper aims to investigate and measure the role played by policies related to employment rights, processing of asylum applications, attractiveness of the welfare system, economic factors and networks on the destination of asylum seekers within the EU. We find that the strongest pull factor for asylum seekers to a destination is social networks, both in terms of previous asylum applicants as well as stock of previous migrants. The results suggest that economic factors are not as important and that asylum seekers are not as attracted by the generosity of welfare state as by social networks. Our findings also suggest that the removal of employment bans would have little impact on the number of asylum seekers given their modest correlation with asylum flows. Finally, our results also highlight the positive association between recognition rate and asylum applications.

Our analysis has important policy implications. We find evidence that policies that restrict access to welfare system or to the labour market have modest impact and therefore are not very effective in terms of reducing the number of asylum applicants. In particular, banning asylum seekers from employment, leads asylum seekers to become more dependent on public spending in the short term, and could result in exploitation. This also leads to negative long terms effects with respect to integration. Hence, lifting the employment ban seem to be more cost effective and better for the integration of refugees in the long term.

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A Appendix

Table A.1: Additional descriptive statistics, Average for 2008-2020

Variable	mean	sd	min	max	obs
Asylum applications (%)	1.054	2.808	0	100	27,476
Asylum applications/pop (%)	0.001	0.010	0	0.781	27,476
Stocks (OECD)	23738.66	97610.29	0	1877662	19,570
Stocks (Eurostat)	20243.56	96948.98	0	1877661	16,705
Stocks (UNDESA)	33778.31	124745.9	0	1655996	19,721
Stocks (UNDESA, middle point)	32264.39	123718.1	0	1834500	20,451
Cumulative sum asy. appl (t-8 - t-5)	649.877	5011.354	0	337390	20,451
Cumulative sum inflows	19693.59	60652.02	0	868301	26,613
No ban	0.107	0.309	0	1	27,476
Less than 3 months of ban	0.260	0.438	0	1	27,476
Employed refugees (%, up to 5 years)	43.550	17.014	7.142	100	27,476
Access to social security (MIPEX)	61.011	44.858	0	100	26,625
Access to labour market (MIPEX)	54.197	21.485	0	100	26,625

Notes: The unit of observation is the number of the dyadic first time asylum seeker applications measured quarterly. The mean is the average of all observations for the period 2008-2020. Source: Authors' calculations based on EUROSTAT (2021a), years 2008-2020; DEMIG-Quantmig data, years 2007-2019; Eurostat data on social spending, years 2007-2019; CEPII GeoDist database; World Bank data on Unemployment rate and real GDP per capita, years 2007-2019.

Table A.2: Robustness Checks: Determinants of asylum applications to the EU, 2008-2020

	(1) (OLS) Asylum app (IHS)	(2) PPML) Asylum app	(3) (PPML) Asylum app	(4) (PPML) Asylum app
Recognition rate (%)	0.00761***	0.00577***	0.00597***	0.00474**
	(0.000672)	(0.00167)	(0.00165)	(0.00147)
Processing time (ln)	-0.0692**	0.0195	0.000846	-0.0167
	(0.0229)	(0.0454)	(0.0405)	(0.0411)
Recognition*Waiting	-0.0141**	-0.0366**	-0.0106	-0.00869
	(0.00527)	(0.0146)	(0.00725)	(0.00693)
Repatriation risk	-0.000694	0.00204	-0.00227	0.00209
	(0.000517)	(0.00132)	(0.00412)	(0.00144)
Total social spending (% GDP, t-4)	0.0781***	0.0367**	0.0403***	0.0248**
	(0.00637)	(0.0128)	(0.0110)	(0.00938)
Access to social security (t-4)	0.0364***	0.0848***	0.0872***	0.0909***
	(0.0108)	(0.0165)	(0.0167)	(0.0158)
Months of ban (ln, t-4)	-0.0610**	-0.148***	-0.165***	-0.144***
	(0.0272)	(0.0324)	(0.0287)	(0.0283)
Cumulated sum as. appl (ln, t-4)	0.598***	0.659***	0.660***	0.660***
	(0.0126)	(0.0300)	(0.0256)	(0.0245)
Controls	Yes	Yes	Yes	Yes
Origin*year FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	27476	25164	27130	27476
R-squared	0.682			
Pseudo R-squared		0.821	0.822	0.817

Notes: Col (1) uses OLS, and the dependent variable is transformed using IHS. All other columns uses PPML. Col (2) excludes outliers in months of ban. Col (3) excludes outliers in repatriation risk. Col (4) does not control for GDP per capita. Standard errors clustered at the country-pair level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$. **Source:** Authors' calculations based on EUROSTAT (2021a), years 2008-2020.