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# Do applications respond to changes in asylum policies in European countries?\*

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## Abstract

We analyze the role of origin-destination-time specific policy measures in shaping the location choices of asylum seekers across European countries. We estimate a gravity equation that reflects the uncertainty that asylum seekers face, concerning the chances of obtaining refugee protection, the processing time and the risk of repatriation. German efforts to expand their processing capacity are correlated with a significant increase in applications from origins with high recognition rates, which were mostly diverted away from Sweden. For Syrians, the observed variations in processing times increased applications in Germany by 16.1 percent, and led to a 35.3 percent reduction in Sweden between 2014 and 2015.

**Keywords:** refugees; recognition rate; processing time; gravity equations; migration; safe countries of origin.

**JEL classification codes:** F22; K37.

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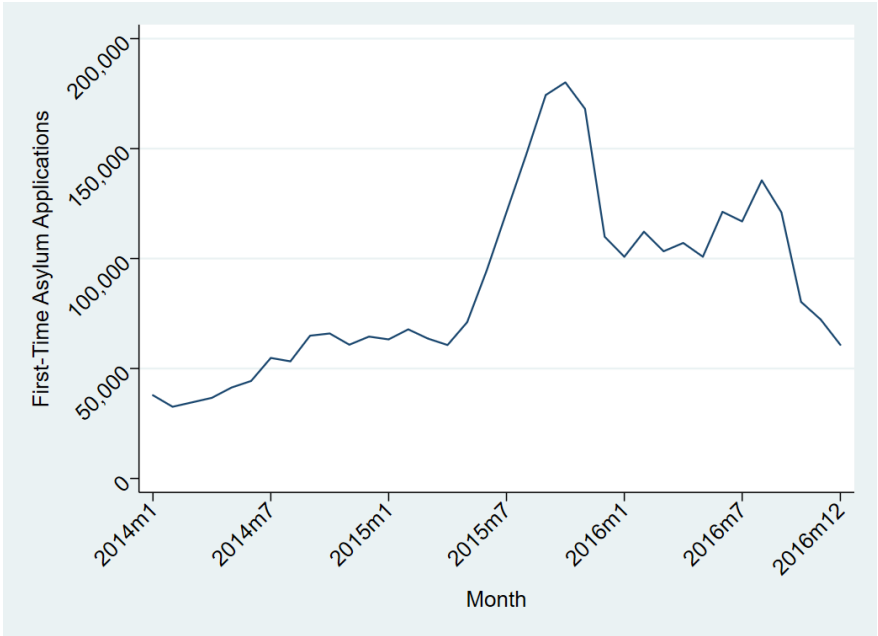
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# 1 Introduction

The European Union received more than 3 million applications for asylum between 2014 and 2016. The total number of asylum seekers in 2015 was more than twice as large as the level that had been reached during the war in the former Yugoslavia in the early 1990s. Figure 1 plots the monthly evolution of the number of asylum applications between January 2014 and December 2016, revealing that the highest value was recorded in October 2015, with almost 180,000 demands for asylum.

Figure 1: Asylum Applications in the European Union



Source: Authors' elaboration on EUROSTAT (2020).

Most of the asylum seekers originated from Syria (26.7 per cent over 2014-2016) and from other conflict-affected countries such as Afghanistan and Iraq, but applications were also received from countries that, according to Freedom House, the Political Terror Scale or the Uppsala Conflict Data Program definitions, were not experiencing an armed conflict, such as Albania and Serbia. Germany received 42.5 per cent of the applications lodged in 2014-2016, with potentially long-lasting consequences on the future evolution of migration flows to this destination (Hanson and McIntosh, 2016), way above Italy (8.5 per cent) and Sweden (8.0 percent), which represented respectively the second and third main recipient

country over this period.

Was there any role for the policies taken by European countries in shaping the distribution of asylum applications across recipient states, once we control for the influence exerted by time-varying conditions at origin? Answering to this research question requires modelling the specific features of the location-decision problem that asylum seekers face. Asylum seekers are confronted with different layers of uncertainty that are far from being resolved even after managing to leave one's own country of origin. This uncertainty concerns not only whether they will eventually obtain refugee status, a factor that has been already explored in the literature, e.g., [Hatton \(2009\)](#), but also the (possibly long) period that is required to process the application, and with respect to what will happen if the application is rejected. In this paper, we include in the expression "refugee status" also other subsidiary forms of protection that can be granted to an asylum applicant. We do not consider an additional aspect of uncertainty that is specific to European destinations, namely the so-called Dublin Regulation, as statistics on the transfers of asylum applications between two EU countries on the basis of these rules are not broken down by the citizenship of the asylum seekers that are concerned. Recipient countries can have a different propensity to request a transfer for applicants from different origins, e.g., Germany decided to suspend the Dublin Regulation for Syrians in August 2015. Still the overall numbers that end up being transferred are quite small: 1.8 per cent of the total number of asylum applications in 2016, for example.

Do asylum seekers react to differences in processing time across destinations, and to the risk of repatriation in the case in which their applications get rejected? Our contribution is to extend the standard analysis of the determinants of the distribution of asylum applications through the estimation of a gravity model including measures of the expected time required to process an asylum application and the risk of repatriation for asylum seekers whose applications are rejected, whose relevance had remained so far unexplored. These two variables are consistently defined and measured across destination countries using standard series provided by EUROSTAT, and we also analyze the interaction between these variables, emphasizing the potential heterogeneous effects of general policy measures for different countries of origin.

The simple conceptual framework that we develop for the demand for asylum suggests that higher recognition rates (intuitively) have a positive effect on the number of applications, an effect that gets diluted when the processing time is high. Processing times exert a

heterogeneous effect on applications, which depends both on the risk of repatriation that rejected asylum seekers face and on their recognition rates. In particular, the negative effect of longer processing times on applications becomes even more negative for origins characterized by larger recognition rates. We also model the supply of asylum by considering a government that minimizes the cost of providing it.

While most of the variability in recognition rates takes place at the origin-time level, i.e., applications from a given origin typically face broadly similar recognition rates across destinations, we document a substantial amount of variation in the processing time at the destination-time level. In fact, all of our estimates include origin-time fixed effects. Thus we do not analyze origin-time determinants of asylum applications, which are the focus of other papers like, for example, [Missirian and Schlenker \(2017\)](#). Regarding processing times, Germany took major actions to increase its capacity to receive and process asylum applications. These included a substantial increase in the size of the BAMF, the German Federal Office for Migration and Refugees, which was partly achieved through the transfer of employees from other branches of the government, from the army and from formerly state-owned enterprises such as Deutsche Telekom or Deutsche Bahn ([Grote, 2018](#)). This can be considered a concrete counterpart of the famous “*Wir schaffen das*” speech by Angela Merkel in August 2015. The rationale for reducing the processing time of asylum applications was twofold. First, the objective was to foster the integration of asylum seekers with good prospects to stay in Germany. There is in fact empirical evidence that proves that the length of asylum procedures increases short-term prospects to integrate into the labor market ([Kosyakova and Brenzel, 2020](#); [Brücker et al., 2019](#); [Brell et al., 2020](#)) and has long-lasting impacts on integration chances ([Hainmüller et al., 2016](#)). Second, a reduced processing time should increase chances to return rejected applicants and thus limit the length of their stay in the host country. Given the substantial number of asylum applications from the Western Balkans, this was one of the main objectives of administrative asylum reform in Germany. In this paper we address another aspect of these policies: the potential implications of reduced processing times on location choices taken by asylum seekers.

When we estimate the relationship between asylum applications at the origin-destination-time level and recognition rates, processing times and repatriation risks, our findings support the theoretical conjecture from the demand side that reduced processing times have a heterogeneous impact depending on the recognition rate and on the repatriation risk. We simulate

the distribution of asylum seekers across destinations in October 2015 (when total applications reached their peak) if the processing time in various European countries had remained unchanged at the levels recorded in January 2014, at the onset of the surge, to gauge the quantitative relevance of our estimates. This exercise suggests that policy measures played a non-negligible role in shaping the distribution of asylum seekers across European countries. The reduction in the average processing time in Germany (from 15.7 to 9.4 months), coupled with an increase from 6.7 to 8.9 months in other European countries, explains 13.5 per cent of the rise in applications lodged in Germany, while the rest of the countries received 7.9 per cent fewer applications. With respect to Syrians, our simulation entails an increase in 16.1 per cent of the applications received by Germany. We find a corresponding 35.3 per cent decrease in Sweden, while applications in other countries barely reacted. The results of our empirical analysis are robust when we replace the EUROSTAT data on the number of monthly asylum applications for Germany with the data coming from the EASY system, which was put in place by Germany to count (on a weekly basis) the number of asylum seekers arriving in the country, and to prepare their reallocation across different federal states, to account for the fact that Germany accumulated a substantial backlog of (not yet lodged) applications in 2014 and 2015.

The three policy measures that we analyze can be considered equilibrium outcomes. While we show that their relationship with asylum applications is compatible with movements along the demand for asylum curve, we are unable to establish causality, lacking an exogenous source of variation on three different policy dimensions. In Section 6, we complement our descriptive exercise with a more precise identification of a particular policy variable that was common enough, albeit not universal, across recipient countries during the period we study: the lists of safe countries of origin, collected by [Guichard \(2020\)](#). When an origin country is placed in such a list for a particular destination, its citizens can be directly and quickly denied asylum. We take advantage from the binary nature of this policy to apply one of the new methods on difference-in-differences designs ([de Chaisemartin and D’Haultfoeuille, 2021](#)) and estimate the effect of the lists of safe countries of origin on asylum applications controlling for heterogeneity and dynamic effects in a non-staggered dataset, finding that applications are substantially reduced around 11 months after the policy is implemented despite a decrease in processing times and a temporary increase in recognition rates.

Our paper follows on a great tradition of empirical estimations of the effects of different

variables on applications. Tim Hatton is probably the most representative author in this strand of literature (Hatton, 2014, 2009, 2016, 2017; Hatton and Moloney, 2017), but there are also early contributions by Neumayer (2004, 2005) or Thielemann (2006), and a recent one by Görlach and Motz (2020), who estimate the policy reaction of some countries to the policies of others in terms of recognition rates. Toshkov (2014) also looked both at the effect of recognition rates on asylum applications and of asylum applications on recognition rates. Hatton (2020) provides a useful summary of the main issues, stating in particular how “[...] policies are hard to quantify” (p. 85).

Our work is different in several respects. First, because of the higher frequency and thus higher variability of the data we exploit, and because we introduce two new variables, processing times and repatriation risks. With respect to processing times, Hatton and Moloney (2017) have considered policy measures, such as the adoption of a list of safe countries of origin, that have a direct influence on processing times, and Andersson and Jutvik (2019) have related the short-lived effect of granting permanent rather than temporary residence to Syrian refugees in Sweden since September 2013 to the resulting increase in the processing time that followed an initial surge in the number of applications. Second, our results entail that the conditions facing asylum seekers, notably concerning the processing time, can evolve even in the absence of explicit policy changes introduced by the destination country. The origin-specific processing time is determined by the interaction between the administrative capacity of the recipient country and of the total number of asylum applications that are received. We can consider our results as lower bounds of the effects of policy measures on asylum flows as long as we assume that governments’ objective functions imply the minimization of costs imposed by the arrival of asylum flows. If we believe instead that governments are maximizing the integration possibilities of asylum seekers or have other humanitarian objectives, the bias could go in the opposite direction.

Our results are also indirectly related to the recent literature on the effects of refugees and asylum seekers on host economies (Borjas and Monras, 2017; Clemens and Hunt, 2019; Dehos, 2021), their selection (Aksoy and Poutvaara, 2021) and on their integration (Fasani et al., 2021a,b). Fasani et al. (2021a) provide evidence that asylum seekers who are subject to an initial employment ban while their application is processed have a significantly lower probability to be employed after the ban is lifted, an effect that can magnify the influence of the processing time on the decision about where to lodge the asylum application. In

particular, the role of processing times in affecting the assimilation of refugees was studied by [Hainmüller et al. \(2016\)](#) in Switzerland and by [Brenzel and Kosyakova \(2019\)](#) in Germany. Differently from those papers, which use micro data for identifying the length of asylum procedures, we need to define processing times from macro variables.

Finally, [Hatton and Moloney \(2017\)](#) and [Guichard \(2020\)](#) are two references that looked at the effects of lists of safe countries of origin on asylum applications, indirectly through a policy index in the case of [Hatton and Moloney \(2017\)](#) and directly in the case of [Guichard \(2020\)](#), whose data we use. Our results are consistent with those in [Guichard \(2020\)](#), particularly when we control, as he does, for multilateral resistance to migration.

The rest of the paper is structured as follows: Section 2 presents the salient and distinctive features of the location-decision problem that asylum seekers face; Section 3 describes our data sources, and how we build measures for the various dimensions of uncertainty that asylum seekers face. Section 4 presents some descriptive statistics, and Section 5 describes the results obtained from the econometric analysis of the relationship between asylum applications and recognition rates, processing times and repatriation risks. Section 6 focuses on the effect of the lists of safe countries of origin on asylum applications. Finally, Section 7 draws the concluding remarks.

## 2 Conceptual framework

### 2.1 Demand for asylum

In order to model the demand for asylum, we start from an individual from an origin country  $j$  that considers lodging an asylum application at time  $t$  in one European country  $k$ . Data on asylum applications are disaggregated by the citizenship of the applicants, so that the origin country of an applicant has to be interpreted as her country of citizenship. We let  $A$  represent the choice set of this potential asylum seeker. The probability  $\mathcal{P}_{jkt}$  that this individual will opt for applying in country  $k$  depends on the expected utility  $\mathbb{E}(u_{jlt})$  that she derives from lodging her application in any country  $l$  belonging to her choice set  $A$ . The location-decision problem that this individual is confronted with certainly shares some features with the corresponding one that economic migrants face, as the choice of the country in which to apply for asylum probably depends on the economic conditions and on the accessibility of the countries belonging to the choice set  $A$  ([Hatton, 2016](#)). However,



the location-decision problem facing a potential asylum seeker is also characterized by some specific features that are related to the various layers of uncertainty related to any asylum application, which are still *unresolved* at the time in which they have to decide where to lodge their application. Specifically, these forms of uncertainty relate: (*i*) to the outcome of the asylum application, (*ii*) to the time required to reach a final decision, and (*iii*) to what will happen if the applicant is denied refugee status. We describe first the specific determinants of the attractiveness of a destination for asylum seekers, and then how the attractiveness of the various alternatives in the choice set maps into choice probabilities. We refer the reader to [Beine et al. \(2016\)](#) for an introduction to the theoretical micro-foundations of migration gravity equations.

### 2.1.1 Uncertainty and the attractiveness of a destination

As far as point (*i*) is concerned, there is substantial variability (both across origin countries and over time) in the share of asylum applications that are eventually accepted. If the expected chances of obtaining refugee status for an applicant from origin  $j$  vary across countries in the choice set, then this could influence the choice of the country in which to lodge an asylum application. We will denote with  $p_{jkt}$  the probability that the asylum application is accepted.

With respect to point (*ii*), recipient countries could be characterized by heterogeneous levels of administrative capacity to process the asylum applications that they received, and they might also set (implicit or explicit) priorities for processing the applications from specific countries of origin. This, in turn, suggests that asylum seekers might be facing an expected time for processing their application that substantially varies across countries in the choice set, and we denote this processing time as  $z_{jkt}$ .

As far as point (*iii*) is concerned, the decision on the asylum application does *not* entail that all uncertainty is eventually resolved. More precisely, asylum applicants that are not granted refugee status might be repatriated to their country of origin, or they might remain as undocumented immigrants. The expected risk of repatriation (and the opportunities for getting an informal employment at destination) could vary across countries and over time, and we denote the risk of repatriation facing applicants that are not granted refugee status as  $q_{jkt}$ .

Let  $\mathbb{E}(u_{jkt}) = f(p_{jkt}, z_{jkt}, q_{jkt}, \cdot)$  represent the expected utility that an asylum seeker

from country  $j$  obtains if lodging her application in country  $k$  at time  $t$ . The notation  $\mathbb{E}(u_{jkt}) = f(p_{jkt}, z_{jkt}, q_{jkt}, \cdot)$  entails that there are additional determinants of expected utility that we leave unspecified. We provide further details in Appendix A.1. What is the relationship between the three distinct forms of uncertainty, and the (expected) attractiveness of a destination country? We clearly have that  $\mathbb{E}(u_{jkt})$  is an increasing function of the recognition rate  $p_{jkt}$ , i.e.,  $\partial\mathbb{E}(u_{jkt})/\partial p_{jkt} > 0$ . Similarly, we should expect that a higher risk of repatriation  $q_{jkt}$  unambiguously reduces the attractiveness of a destination, i.e.,  $\partial\mathbb{E}(u_{jkt})/\partial q_{jkt} < 0$ . This effect can be expected to vanish when the recognition rate is sufficiently close to 1, so that what happens in the (extremely unlikely) event of rejection becomes immaterial.

The relationship between the expected utility  $\mathbb{E}(u_{jkt})$  and the processing time  $z_{jkt}$  is ambiguous, and it crucially depends on the comparison between the (instantaneous) utility that an individual receives while her application is processed and after a decision has been reached. When the recognition rate is high, i.e., asylum seekers are typically granted refugee status, then we should have that a lengthy application processing reduces the attractiveness of a destination, i.e.,  $\partial\mathbb{E}(u_{jkt})/\partial z_{jkt} < 0$ . Indeed, a longer time required to reach a final decision can be a source of anxiety for the applicants, and it can refrain asylum seekers from investing in country-specific skills, e.g., language proficiency, that are positively related to their employment prospects in the labor market at destination (Dustmann et al., 2017; Fasani et al., 2021b). The negative relationship between the expected length of the processing time and the attractiveness of a destination is reinforced when asylum seekers are subject to an employment ban (Fasani et al., 2021a). However, for asylum applicants having low chances of being granted refugee status and facing a high risk of repatriation after the rejection of their application, a longer processing time could *increase* the attractiveness of a destination, i.e.,  $\partial\mathbb{E}(u_{jkt})/\partial z_{jkt} > 0$ , as their instantaneous utility declines after their application has been processed and rejected. Asylum applications could be used as a temporary legal migration scheme, as applicants are protected against the risk of repatriation while their application is pending, and they could also be entitled to work (possibly after the end of a temporary employment ban) or to receive public transfers.

### 2.1.2 Choice probabilities

If we assume that the utility that individual  $i$  derives from lodging an asylum application is given by the sum of the expected utility  $\mathbb{E}(u_{jkt})$  described above and of an individual-specific

stochastic component  $\epsilon_{ijkt}$ , then the distributional assumptions on the latter determine the relationship between the choice probability  $\mathcal{P}_{jkt}$  and the vector of location-specific expected utilities. If we assume that  $\epsilon_{ijkt}$  is identically and independently distributed according to a double exponential distribution, then we have that (McFadden, 1974):

$$\mathcal{P}_{jkt} = \frac{e^{\mathbb{E}(u_{jkt})}}{\sum_{l \in A} e^{\mathbb{E}(u_{jlt})}}, \forall k \in A. \quad (1)$$

Letting  $a_{jkt}$  represent the number of asylum applications lodged in destination  $k$  by applicants from country  $j$  at time  $t$ , the law of large numbers entails that  $\mathcal{P}_{jkt} = a_{jkt}/a_{jt}$ , where  $a_{jt} \equiv \sum_{l \in A} a_{jlt}$  is the total number of applications at time  $t$  from the origin  $j$ . The canonical distributional assumptions that we introduced entail that:

$$\ln(a_{jkt}) = \mathbb{E}(u_{jkt}) - \ln\left(\sum_{l \in A} e^{\mathbb{E}(u_{jlt})}\right), \forall k \in A. \quad (2)$$

Thus, the logarithm of the number of asylum applications  $a_{jkt}$  is a linear function of the expected utility  $\mathbb{E}(u_{jkt})$  associated to destination  $k$  itself, and of a term that varies across origins and over time, but *not* across alternatives  $k$  in the choice set  $A$ , and that can thus be controlled for in the estimation through origin-time dummies. Even though the distributional assumptions justify (with an adequate structure of fixed effects) the regression of  $\ln(a_{jkt})$  on the attractiveness of destination  $k$  only, this model allows for diversion effects across destinations. In particular, under the assumption that  $a_{jt}$  is constant,<sup>1</sup> notice that we have that:

$$\frac{\partial a_{jkt}}{\partial \mathbb{E}(u_{jkt})} = \frac{\partial \mathcal{P}_{jkt}}{\partial \mathbb{E}(u_{jkt})} a_{jt} = \mathcal{P}_{jkt} (1 - \mathcal{P}_{jkt}) a_{jt}, \forall k \in A. \quad (3)$$

and:

$$\frac{\partial a_{jkt}}{\partial \mathbb{E}(u_{jlt})} = \frac{\partial \mathcal{P}_{jkt}}{\partial \mathbb{E}(u_{jlt})} a_{jt} = -\mathcal{P}_{jkt} \mathcal{P}_{jlt} a_{jt}, \forall k, l \neq k \in A. \quad (4)$$

If we combine these standard results with our conjectures above on the relationship between the three dimensions of uncertainty and the expected utility associated to each destination, then we have that variations in the recognition rate, the processing time and the risk of repatriation in a given country influence the number of asylum applications received by alternative destinations within the choice set. The coefficients that will be estimated can

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<sup>1</sup>This assumption follows naturally from the micro-foundations of a gravity equation through a RUM model *à la* McFadden, where identification comes from variations in the distribution of asylum applications across alternative destinations, and not from variations in the total number of applications.

thus be used to generate scenarios in which we modify the values of the three dimensions of uncertainty in one or more of the European countries, and we simulate the corresponding origin-specific number of asylum applications in each recipient country.

### 2.1.3 Heterogeneity in asylum credentials

The above assumptions embody any heterogeneity in asylum credentials within origin countries  $j$  in the error term  $\epsilon_{ijkt}$ . In reality, it is likely that some individuals will have a higher probability of obtaining asylum than others, for example because of prosecuted religious or sexual orientations, and this would generate correlation in  $\epsilon_{ijkt}$  across origins, destinations and time. The data would then not satisfy the independence of irrelevant alternatives assumptions implied by the i.i.d. character of the error term. In theoretical terms, we can redefine  $j$  to denote relevant characteristics that ensure common recognition chances in our model. Empirically, we are unable to separately identify these characteristics that would induce a correlation and we would need to control for multilateral resistance to migration in order to obtain unbiased estimates (Bertoli and Fernández-Huertas Moraga, 2013; Beine et al., 2016). Appendix A.2 contains all the main estimates of the paper from a specification of the gravity equation that is consistent with a more general distribution of the stochastic component of utility, and thus addresses the possible bias due to multilateral resistance to migration in our benchmark estimates.

## 2.2 The supply of asylum

In order to model the supply of asylum, we could consider the incentives of governments in destination countries to provide this international public good. However, we follow Fernández-Huertas Moraga and Rapoport (2014) and simplify the government’s problem by abstracting from the externalities that arise and focusing on the minimization of total costs. This cost minimization can be understood in very general terms. For example, asylum seekers can also be considered beneficial for destination countries so that this would show up as negative costs.

Consider an European country  $k$  that chooses a mix of asylum policies with the objective of minimizing the cost of hosting  $a_{kt} = \sum_j a_{jkt}$  asylum applicants at time  $t$ . Cost minimization will imply the equalization of marginal costs across the origin countries of asylum seekers. Let  $\mathbb{E}(c_{jkt}) = g(p_{jkt}, z_{jkt}, q_{jkt}, \cdot)$  represent the expected marginal cost that an asy-

lum seeker from country  $j$  imposes on country  $k$  by lodging her application there at time  $t$ . Following a parallel strategy to the one that we used to model the demand side, what is the relationship between the three distinct forms of uncertainty that asylum seekers face, and the (expected) marginal cost they generate? We have that  $\mathbb{E}(c_{jkt})$  is an increasing function of the recognition rate  $p_{jkt}$ , i.e.,  $\partial\mathbb{E}(c_{jkt})/\partial p_{jkt} > 0$ , as long as the marginal cost of accepting an application is larger than the marginal cost of rejecting it (see Appendix A.1 for details). Similarly, we should expect that a higher risk of repatriation  $q_{jkt}$  unambiguously reduces the cost of receiving an application if the marginal cost of repatriating a rejected asylum seeker is smaller than the marginal cost of hosting it as an undocumented immigrant, i.e.,  $\partial\mathbb{E}(c_{jkt})/\partial q_{jkt} < 0$ .

The relationship between the expected marginal cost  $\mathbb{E}(c_{jkt})$  and the processing time  $z_{jkt}$  is clearly negative,  $\partial\mathbb{E}(c_{jkt})/\partial z_{jkt} < 0$ , as long as the marginal cost of processing an application is smaller than the marginal cost of accepting it and also smaller than the marginal cost of rejecting it.

Finally, we assume that the supply of asylum by country  $k$  at time  $t$  for individuals from origin  $j$  is inversely related to this expected marginal cost: the higher the expected marginal cost, the lower the number of desired asylum applications. Hence, the number of asylum applications a country is willing to receive is associated to variations in the recognition rate, the processing time and the risk of repatriation.

## 2.3 Equilibrium

Our empirical application will exploit equilibrium outcomes, where the demand for asylum equates the supply. Under the assumptions stated above, we will have that:

- A positive correlation between recognition rates and asylum applications is compatible with movements along the demand for asylum, as  $\partial\mathbb{E}(u_{jkt})/\partial p_{jkt} > 0$ , but not with movements along the supply of asylum, as  $\partial\mathbb{E}(c_{jkt})/\partial p_{jkt} > 0$  and cost minimization would lead to a negatively sloped supply.
- A negative correlation between repatriation risks and asylum applications is compatible with movements along the demand for asylum, as  $\partial\mathbb{E}(u_{jkt})/\partial q_{jkt} < 0$ , but not with movements along the supply of asylum, as  $\partial\mathbb{E}(c_{jkt})/\partial q_{jkt} < 0$  and cost minimization would lead to a positively sloped supply.

- A negative correlation between processing times and asylum applications is compatible with movements along the demand for asylum, as  $\partial\mathbb{E}(u_{jkt})/\partial z_{jkt} < 0$ , but not with movements along the supply of asylum, as  $\partial\mathbb{E}(c_{jkt})/\partial z_{jkt} < 0$  and cost minimization would lead to a positively sloped supply.

In reality, the ability of the empirical results to differentiate demand and supply movements would depend on the type of welfare function that the governments are actually maximizing. If we assume that the governments want to minimize the arrival of asylum seekers, as we did above, we should expect policies to tighten for a particular nationality as more asylum seekers from that nationality arrive. In that case, our estimates of the impact of restrictive policies would be downward biased. If, on the contrary, governments are more humanitarian, and ease access conditions as a response to larger inflows, then we would expect our estimates of the impact of restrictive policies to be upward biased.

Given the heterogeneity of the relationship between different measures of asylum policies and asylum applications that we will end up uncovering, a third possibility is that the government may make mistakes in reacting to larger asylum inflows. For example, a government might increase processing times for asylum seekers of a given nationality in order to reduce inflows with the unintended consequence of increasing those inflows whenever the repatriation risk is high and the recognition rate is low. In such a case, the direction of the bias can even be ambiguous, depending again on the type of welfare function that the government maximizes.

## 2.4 Strategic interactions

Our simple conceptual framework sketched above abstracts from potential strategic interactions in the setting of asylum policies. Empirically, we will consider them as another instance of omitted variable bias. We have argued elsewhere that strategic interactions like the ones documented by [Bratu et al. \(2020\)](#) or [Bertoli and Fernández-Huertas Moraga \(2015\)](#) among others for immigration policies in general would show up in the multilateral resistance to migration term in a gravity equation ([Beine et al., 2016](#)), so we refer the interested reader to [Appendix A.2](#) for specifications that will control for multilateral resistance to migration and, hence, for strategic interactions in asylum policies. In theory, in the context of a very simple model where host countries react to other countries tightening their policies by tightening theirs, for example [des Places and Deffains \(2003\)](#), we would expect that our coefficients on

policy variables would be downward biased in absolute value. The reason is that changes in, for example, the recognition rate in one destination country would be positively correlated with changes in the recognition rate in other destinations and our recognition rate variable would be picking up both the own effect and the cross-effects, which would have the opposite sign, hence the downward bias. This is what [Görlach and Motz \(2020\)](#) termed as strategic complementarities in recognition rates. In fact, [Görlach and Motz \(2020\)](#) find that both strategic complementarities and substitutabilities were present in the reaction to Syrian arrivals to Europe, because for certain pairs of countries the diversion effects that [des Places and Deffains \(2003\)](#) modeled would be dominated by an attraction effect, whereby a country would respond to a neighbor increasing its recognition rate and increasing general arrivals in Europe, by decreasing its own to prevent these arrivals from reaching its soil.

### 3 Data and definitions

EUROSTAT represents our main data source. It provides us with information about our dependent variable  $a_{jkt}$ , i.e., the monthly number of first-time asylum applications from citizens of the origin  $j$  lodged in the European country  $k$  in each month  $t$  since January 2008. “First time applicant for international protection (as defined by Articles 2(h) and 2(i) of Qualification Directive 2011/95/EU) is a person who lodged an application for asylum for the first time in a given Member State. The term ‘first time’ implies no time limits and therefore a person can be recorded as first time applicant only if he or she had never applied for international protection in the reporting country in the past, irrespective of the fact that he is found to have applied in another Member State of the European Union.” ([EUROSTAT, 2016](#), p. 14). EUROSTAT also generates a series on total asylum applications, which is highly correlated with first-time asylum applicants: as much as 99.87 per cent. EUROSTAT is also the source of the series that we use to build proxies for the three dimensions of uncertainty that we introduced in [Section 2.1.1](#).

#### 3.1 Policy measures

We describe here how we build the empirical measures of the three dimensions of uncertainty facing asylum applicants: the recognition rate  $p_{jkt}$ , the length of the processing time  $z_{jkt}$ , and the risk of repatriation  $q_{jkt}$  for applicants that are denied refugee status. All these

variables will be dyadic, i.e., specific to a given country of origin (citizenship)  $j$  of the applicant and to a given country of destination  $k$ , and varying over time  $t$ . Our approach to the measurement of these dimensions of uncertainty has the merit of overcoming the need to compile information about actual destination-specific time-varying policies, like the establishment of a list of safe countries of origin that we explore in section 6. This comes at the cost of being *unable* to define these variables for origin-destination-time triplets with a very limited number of asylum applications, something that creates the need to restrict our sample to origin-destination pairs with a sufficient number of applications. The problem posed by these triplets is compounded by the practice of EUROSTAT of rounding all series to the nearest 5, as this can, for instance, induce large artificial swings in the recognition rate when it is computed out of a low number of decisions.

### 3.1.1 Recognition rate

The first proxy is given by the share of first-instance decisions with a positive outcome for the asylum applicant, the latter including applicants granted refugee status, subsidiary protection status, temporary protection or authorization to stay for humanitarian reasons. This dyadic variable is available at a quarterly frequency. The choice to use first-instance decisions is in line with [Hatton and Moloney \(2017\)](#). We could also build a similar variable with a lower, i.e., yearly, frequency on the basis of final-instance decisions; “[t]he asylum procedures and the numbers/levels of decision making bodies differ between Member States. The true ‘final instance’ may be, according to the national legislation and administrative procedures, a decision of the highest national court. However, it is not intended that these statistics should cover rare or exceptional cases determined by the highest courts. Thus, the statistics related to the ‘final decisions’ [...] should refer to decisions against which there is no further possibility to appeal on the substance of the decision but only on procedural grounds.” ([EUROSTAT, 2016](#), p. 16).

### 3.1.2 Processing time

The construction of our measure of the expected length of the period between an asylum application and the final decision on this application combines information on the stock of pending applications with information on the number of first-time asylum applications. [OECD \(2018\)](#) followed a similar approach to define a time-varying expected processing time



that was specific to each destination but, differently from our measure, invariant across origins. Our constructed processing time allows us to overcome the challenge posed by the fact that most recipient countries, with Sweden being an exception (OECD, 2018), do not publish statistics on the actual processing time of asylum applications.

EUROSTAT publishes series on the number of applicants from origin  $j$  that are subject to a pending asylum application in destination  $k$  at the end of each month.<sup>2</sup> The evolution of the stock of pending applications reflects the difference between the number of applications that enter the system and the number of applications that exit the system each month. The number of pending asylum applications, that we denote with  $s_{jkt}$ , increases whenever an asylum application is lodged directly in country  $k$ , or because it is transferred there in the application of the Dublin procedures. This number declines when: (i) a final decision is taken; (ii) a negative first-instance decision is not appealed against within the time limit set by the destination country; (iii) the application is withdrawn; or (iv) the request by destination  $k$  to transfer the application to another European country is accepted.

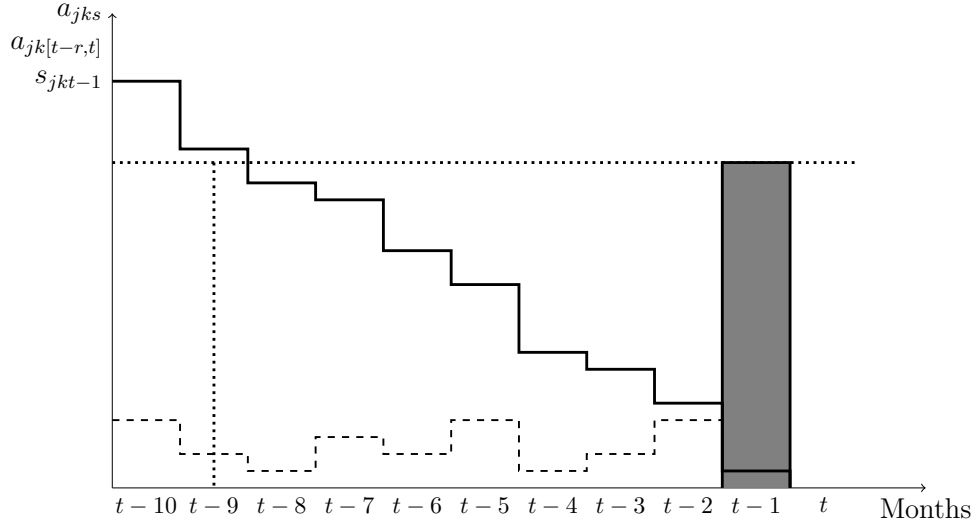
Our measure of the expected processing time  $z_{jkt}$  varies at the monthly level, and it is defined by the comparison of the stock of pending applications  $s_{jkt-1}$  (thus, at the end of month  $t - 1$ ) with the cumulated sum of past first-time asylum applications up to month  $t - 1$ . Specifically, let  $a_{jk[t-r,t]}$  be defined as the number of first-time asylum applications from the origin  $j$  lodged in the destination  $k$  between month  $t - r - 1$  and month  $t - 1$ , i.e.,  $a_{jk[t-r,t]} \equiv \sum_{s=t-r-1}^{t-1} a_{jks}$ , with  $s = 0, 1, 2, \dots$ . As  $a_{jks} \geq 0$ ,  $a_{jk[t-r,t]}$  is weakly monotonically increasing in  $r$ . We define the expected processing time  $z_{jkt}$  as the (unique) value of  $r$  such that  $a_{jk[t-r,t]} \leq s_{jkt-1}$ , and  $a_{jk[t-r-1,t]} > s_{jkt-1}$ . Figure 2 reports an arbitrary combination of the number of first-time asylum applications between month  $t - 10$  and month  $t - 1$  for a given dyad ( $j, k$ ), together with the stock of pending applications at the end of month  $t$ . In this example, it is necessary to sum applications over 9 months (from  $t - 1$  to  $t - 9$ ) before we exceed to stock of pending applications at the end of month  $t - 1$ .

Notice that a surge in asylum applications does not produce any mechanical impact on our measure of the processing time, as it would shift upwards both  $a_{jk[t-r,t]}$  and  $s_{jkt-1}$ , which are depicted in Figure 2. It is clear that asylum applicants do not base their expectation about the time required to process an application that is lodged in month  $t$  on the basis of

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<sup>2</sup>“This table should include the number of persons with pending applications at all instances of the administrative and/or judicial procedure including applications that are the subject of an appeal or review where a final decision has not been taken on the application.” (EUROSTAT, 2016, p. 23).

Figure 2: Definition of the processing time



Notes: the dashed line represents the monthly number of first-time asylum applications, while the solid line represents the cumulated number of applications; the gray bar is the stock of pending applications at the end of month  $t - 1$ .

the observation of the flow of first-time asylum applications and of the stock of pending applications up to the end of the previous month, but we assume that this number is correlated with an average of the actual experiences of previous asylum seekers from the same origin country in the same destination. Prospective asylum seekers would directly or indirectly gain knowledge about the situation of these previous applicants.

### 3.1.3 Risk of repatriation

EUROSTAT provides statistics on the enforcement of immigration legislation. In particular, it provides yearly data (by country of citizenship) on the number of third-country nationals that: (i) have been found to be illegally present; (ii) have received an order to leave; and (iii) have been returned following an order to leave. Differences across origins in the values of these series reflect differences in the (unknown) size of the population at risk, represented by the number of individuals illegally present at destination. This, in turn, includes asylum applicants whose application has been rejected, individuals that have entered illegally at destination, or visa over-stayers. We build a measure of the risk of repatriation by taking the ratio between the third of these three series (individuals who have been returned) and the

origin-specific number of negative final-instance decisions taken in the previous year. The relevant population at risk is clearly larger than this, as it also includes all individuals without a legal residence permit at destination, a group that extends well beyond the asylum seekers that are denied refugee status, including, for instance, undocumented immigrants and visa over-stayers; this explains why this ratio can be above 1. On the other hand, an unknown number of rejected asylum seekers may decide to leave voluntarily, so that they would not be counted as returned.

## 4 Descriptives

Our dependent variable is the number of first-time asylum applications lodged in a particular month in a given European country from a specific country of origin. Our dataset runs between January 2009 and June 2017, i.e., 102 months. As detailed in Section 3 above, monthly data on the number of first-time asylum applications are available since January 2008. However, the initial portion of this series is used to define our measure of the expected processing time. We keep all the 32 destination countries from EUROSTAT,<sup>3</sup> and select the origins that account for at least 1 per cent of the total number of applications during the period, which means 24 different countries of citizenship and 768 origin-destination pairs.<sup>4</sup> These observations account for 84 per cent of all first-time asylum applications in Europe throughout this period. 14 per cent of the observations are missing while 45 per cent are zeros. Fixed effects (month and origin) pick up 3 per cent of the variation in the panel in  $a_{jkt}$ . When we drop zeros, we are left with 31,701 observations. After a logarithmic transformation, origin-month fixed effects pick up 8 per cent of the variation in  $\ln(a_{jkt})$ , while destination-month fixed effects account for 29 per cent of the variation. Most of the variation in our panel is explained by dyadic, i.e., origin-destination, fixed effects: 68 per cent. Overall, 82 per cent of the variation in the data is accounted by dyadic, origin-month

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<sup>3</sup>The 32 countries receiving asylum applications are Austria, Belgium, Bulgaria, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Cyprus, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, United Kingdom, Iceland, Norway, Slovenia, Slovakia, Spain, Sweden and Switzerland.

<sup>4</sup>The list of countries of origin includes Afghanistan, Albania, Algeria, Bangladesh, Democratic Republic of the Congo, Eritrea, Macedonia, Gambia, Georgia, Guinea, Iran, Iraq, Kosovo, Mali, Nigeria, Pakistan, Russia, Serbia, Somalia, Sri Lanka, Sudan, Syria, Turkey and Ukraine.

and destination-month fixed effects.

As explained above, we focus our analysis on three dyadic time-varying policy measures: recognition rates, processing times and repatriation risks. First-instance recognition rates vary at the quarterly level,<sup>5</sup> processing times have a monthly variation and repatriation risks are measured yearly.

Table 1 presents some summary statistics for the main variables in the paper. When we concentrate on the observations for which we do not have missing policy measures, we are left with 21,905 origin-destination-month observations, totaling 85 per cent of the remaining applications and 3.4 million asylum applications overall. This share stands at 88 per cent if we only focus on 2014-2016, i.e., the years of the surge in applications to European countries: 1.9 million asylum applications.

The average value of our dependent variable  $a_{jkt}$  is 155 first-time applications from an origin to a destination in a given month. There is a lot of variability in the dataset, from the minimum 5 reported by EUROSTAT,<sup>6</sup> to a maximum of nearly 37,000 applications from Syrians in Germany in February 2016.

Regarding our policy measures, the average recognition rate in the dataset is 0.28, i.e., 28 per cent of first-instance decisions correspond to granting refugee status. On average, the largest recognition rate over the period would correspond to Eritreans at 0.78 with a minimum of 0.02 for Macedonians. Looking over destinations, the country with the largest average recognition rate is Malta at 0.69 while the lowest corresponds to Latvia at 0.02.

Our second policy measure is the average number of months a prospective asylum seeker can expect to wait for a decision in a given destination based only on her country of citizenship. The average value in our dataset is 9.5 months. For example, this is a typical value for applicants from Iraq in Germany. On average, applicants from the Democratic Republic of Congo had to wait more than 14 months during this period, compared with a minimum waiting time of less than 7 months for Syrians, Eritreans and Serbians. By destination, the longest processing times on average took place in Ireland (over 18 months) while the lowest happened for asylum seekers in Portugal (little over 1 month).

Since we are using a proxy for the repatriation risk, its average numbers are not directly interpretable, given that we are not able to correctly measure the entire population at risk,

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<sup>5</sup>Results are equivalent if we use final instance decision rates, or a combination of both.

<sup>6</sup>EUROSTAT rounds to 5 the figures of first-time asylum applications, so that the lowest number of asylum applications that is reported is 5, and a number of applications below 3 is rounded to 0.

Table 1: Summary statistics in the full sample and by repatriation risk

Variables	Obs.	Mean	Std. Dev.	Min	Max
<i>Panel A: Full sample</i>					
First-time asylum applications	21,905	155	892	5	36,860
Recognition rate	21,905	0.28	0.31	0.00	1.00
Processing time (months)	21,905	9.51	7.52	0.00	36.00
Repatriation risk	21,905	5.48	18.82	0.00	497.00
<i>Panel B: High repatriation risk</i>					
First-time asylum applications	11,615	132	760	5	30,865
Recognition rate	11,615	0.27	0.31	0.00	1.00
Processing time (months)	11,615	8.27	6.66	0.00	36.00
Repatriation risk	11,615	9.48	25.02	0.00	497.00
<i>Panel C: Low repatriation risk</i>					
First-time asylum applications	10,290	180	1,021	5	36,860
Recognition rate	10,290	0.30	0.30	0.00	1.00
Processing time (months)	10,290	10.92	8.16	0.00	36.00
Repatriation risk	10,290	0.96	2.95	0.00	75.00

Notes: Repatriation risk proxied by the total number of persons returned from a destination for a given citizenship divided by the total number of negative decisions for the group. High repatriation risk defined as repatriation risk above the weighted median (1.46) in the previous year.

Source: Authors' elaboration on [EUROSTAT \(2020\)](#).

as briefly discussed in Section 3.1.3. Still, it is interesting to have a look at a representative average country and minima and maxima both over origins and destinations. In the first case, a representative value of the average in Table 1 would be applicants from Bangladesh in the United Kingdom. Among origins, the largest average repatriation risk would be faced by Ukrainians while the lowest would correspond to applicants from the Democratic Republic

of Congo. By destination, the value of the proxy is the highest on average for applicants in Bulgaria while the lowest is again the one in Malta.

Somehow surprisingly, the correlation between the three policy measures seems to be quite low for this period. The largest value is a correlation of -0.07 between the recognition rate and the processing time. One could think that the relationship between these two variables would be non-monotonic, with the lowest processing times for applicants with either very high or very low chances of obtaining refugee status. This was certainly the case for Germany at the end of the period, as we document below, but it is not a general finding. The rest of correlations among policies is -0.03 between the recognition rate and the repatriation risk and -0.04 between processing times and the repatriation risk.

From the theory side, what the lack of correlation between the three policy measures could be showing is different agents within a government, or a country, taking different decisions. This has been documented in the political science literature. For example, [Keith et al. \(2013\)](#) study how the ideology of judges affects their decisions on asylum claims in the US while [Johannesson \(2018\)](#) finds the same results for Sweden. In the European Union as a whole, [Thielemann and Zaun \(2018\)](#) document how some instances of asylum policy are delegated at the European level and this allows for a greater protection of asylum seekers. Within countries, [Thielemann et al. \(2018\)](#) suggest discrepancies between first and second instance refugee determination decisions that they attribute to different levels of insulation from government objectives at each point in time. This literature refers only to recognition rates and it could explain the lack of correlation between recognition rates and processing times. With respect to repatriation risks, the fact that we are using a proxy (number of people returned following an order to leave divided by rejected applications) can generate a lack of correlation. Policies towards undocumented immigrants in general could not necessarily be aligned with policies towards asylum seekers and the numerator of our proxy includes both rejected asylum seekers and other undocumented immigrants.

What is more clearly intuitive is the source of the variation in each of the policy measures. [Table 2](#) shows that most of the variation in both the dependent variable and in the repatriation risk comes from dyadic origin-destination time-variant and time-invariant sources. However, the relevance of origin and destination factors varies clearly across variables. Origin-month factors explain more than half of the variance of the recognition rate across origins, destinations and months. This makes sense as international law dictates that

destination countries should decide on asylum applications based on objective criteria about the situation in the countries of origin. This does not mean destination countries do not exert some discretion since destination-month dummies still explain 9 per cent of the variation in recognition rates.

Table 2: Sources of variation in the data

Dummies	Log asylum applications	Recognition rate	Processing time	Repatriation risk
Origin-month	0.12	0.53	0.04	0.04
Destination-month	0.29	0.09	0.54	0.21
All (including dyadic)	0.84	0.79	0.70	0.63

Notes: Adjusted- $R^2$  on regressions of each of the variables described in the column heading on the set of fixed effects described in the rows; “All (including dyadic)” refers to specifications including origin-month, destination-month and dyadic fixed effects; the sample used in the regressions corresponds to origin-destination-month 21,905 observations, as in Panel A in Table 1.

Source: Authors’ elaboration on [EUROSTAT \(2020\)](#).

The sources of variation are quite different for processing times. It is clear that this variable has more to do with the capacity of receiving governments and their decisions to spend more or less resources to process asylum applications. More than half of the variation in processing times stems from destination-time factors. German efforts to cope with the surge in the number of asylum applications provide a telling example of the relevance of destination time-varying factors in explaining the variations in the processing time, as these quotes from [Grote \(2018\)](#) reveal:

“The Federal Office hired thousands of new staff in the period under review (from 2014; to an increased extent from autumn 2015); the workforce had increased from around 2,100 employees (FTE) to 7,400 FTE by early 2014 as at 15 November 2017. [...] In order to solve the acute staff shortage at the Federal Office, more than 3,100 employees of the German Federal Armed Forces, Federal Labour Office and other federal ministries, federal authorities and formerly state-owned companies Deutsche Telekom, Deutsche Bahn, Deutsche Post and Vivento have meanwhile been seconded or transferred temporarily to the Federal Office in a supportive capacity.” (p. 42).

“The Federal Office managed to maintain this high volume of decisions, peaking at 87,649

decisions per month by May 2017. Since June 2017, there has once again been a sharp decline in the number of decisions taken owing to a range of measures and staff restructuring steps implemented with the result that the average number of decisions taken each month has leveled off at 35,000.” (p. 18).

These measures taken to scale up processing capacity are probably the practical side of the famous “*Wir schaffen das*” speech by Angela Merkel made in August 2015. The rationale behind these policies was twofold (BMI, 2015). First, against the background of a substantial influx of asylum seekers with low approval chances from the Western Balkans, a faster processing of asylum applications should increase repatriation risks and reduce migration incentives for individuals from those countries. Second, faster processing times should also boost integration chances of individuals with good prospects to stay in Germany. Consequently, to shorten processing time, over and above the additional administrative capacity, Germany also adopted a cluster approach by March 2016, prioritizing the processing of applications from both countries with good and poor staying prospects, defined on the basis of the recognition rate. So-called Dublin-cases, i.e. asylum seekers who had been registered already in other countries applying the Dublin Agreements, were prioritized as well. Applicants from countries with a recognition rate above 50 percent (Eritrea, Syria, ethnic minorities from Iraq, Somalia since 2017) and safe countries of origin (the Western Balkan countries, Ghana, Senegal) saw a reduction in the time required to process their applications, while the processing time for applicants from the remaining countries was increased. Note that even before the introduction of the cluster approach the BAMF applied already various prioritization schemes and that the cluster system was already tested since the fall of 2015. Kosyakova and Brücker (2020) provide more details.

## 5 Econometric analysis

We estimate the following gravity equation:

$$\ln(a_{jkt}) = \alpha p_{jkt} + \beta z_{jkt} + \gamma q_{jkt} + d_{jk} + d_{jt} + d_{kt} + \xi_{jkt}, \quad (5)$$

where  $d_{jk}$ ,  $d_{jt}$  and  $d_{kt}$  represent origin-destination, origin-time and destination-time dummies. Notice that the inclusion of origin-time dummies  $d_{jt}$  in the set of regressors entails that variations in the recognition rate for a given origin that are common to all destinations, e.g., because of seriously deteriorating security conditions at origin, do not contribute to



the identification of the coefficient  $\alpha$  in Eq. (5). By the same token, origin-time dummies capture the (origin-specific) effect of EU-wide policy changes, such as the agreement signed with Turkey in March 2016, as far as these do not vary across destinations. Similarly, the inclusion of destination-time dummies  $d_{kt}$  in the set of regressors implies that variations in the processing time that are common to all origins for a given destination do not contribute to the identification of the coefficient  $\beta$  of in Eq. (5). Notice that in Eq. (5),  $\alpha$ ,  $\beta$  and  $\gamma$  represent the semi-elasticity of the share of applications  $a_{jkt}/a_{jt}$  lodged in destination  $k$  with respect to the recognition rate  $p_{jkt}$ , processing time  $z_{jkt}$  and the repatriation risk  $q_{jkt}$ , which represent an upper bound of the semi-elasticity of the total number of applications  $a_{jkt}$ .<sup>7</sup> We cluster standard errors at the origin-month level; this choice is justified by the fact that we are focusing on the joint decision of applying for asylum on a particular month by members of the same origin country. That is the level of aggregation of individual decisions in Eq. (5).<sup>8</sup> When estimating Eq. (5), we weight observations by the number of applications  $a_{jt}$  in Europe coming from a particular origin. Weighting observations is necessary to assign the same influence to each individual asylum application, i.e., assigning a larger weight to larger corridors.<sup>9</sup>

We also extend the empirical specification by allowing for an interaction term between the recognition rate and the processing time:

$$\ln(a_{jkt}) = \alpha p_{jkt} + \beta z_{jkt} + \gamma q_{jkt} + \delta p_{jkt} \times z_{jkt} + d_{jk} + d_{jt} + d_{kt} + \xi_{jkt}, \quad (6)$$

possibly splitting the sample into two parts on the basis of the risk of repatriation and thus dropping  $\gamma q_{jkt}$ , as our risk of repatriation only changes at the yearly level and hence it might be more difficult to capture the heterogeneous behavior of the other variables with an interaction.

As discussed above, in Section 2.3, the semi-elasticities that can be recovered from these specifications will allow us to understand whether our sample period was dominated by

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<sup>7</sup>We have that:

$$\frac{\partial a_{jkt}}{\partial p_{jkt}} \frac{1}{a_{jkt}} = \alpha \mathcal{P}_{jkt} (1 - \mathcal{P}_{jkt}) \frac{a_{jt}}{a_{jkt}} = \alpha (1 - \mathcal{P}_{jkt}) \leq \alpha.$$

<sup>8</sup>Clustering at the origin-quarter or at the origin-year level marginally increases the standard errors; the results are available from the Authors upon request.

<sup>9</sup>The estimates from unweighted specifications for the main results of the paper are presented in the On-line Appendix.

movements along the demand or the supply of asylum. If asylum policies become more restrictive in an attempt to curb the number of asylum seekers to reduce costs, this will reduce recognition rates and increase processing times, more so for applicants with high recognition rates. In this case our estimates represent the lower bound of the demand semi-elasticities, i.e. the absolute value of the coefficients on the recognition rate as well as on the combined effect of the recognition rate and processing time are downward biased.

We choose to include contemporaneous values of both the dependent and independent variables. Earlier asylum applications are a component of the definition of both the recognition rate, the processing time and the repatriation risk, and we want to prevent mechanical correlations from affecting our results. This may be muted in the case of recognition rates and repatriation risks, where earlier applications would be a part of the denominator, but it could be more substantial with respect to processing times, which we build by aggregating earlier asylum applications. Also, given the heterogeneity of origins and destinations it would be difficult to select an appropriate lag structure. From the point of view of the demand, we can have countries that are close enough so that potential asylum seekers react to changes in policies in a couple of months while other farther from Europe could take much longer to do so. We take advantage from the persistence in the variables over time to identify correlations using contemporaneous variables so that we maximize the sample size.

## 5.1 Baseline results

Table 3 presents the results for Eqs. (5) and (6) on the full sample. The results in Column (1) indicate that the recognition rate for an origin-destination pair is not significantly associated with the origin-specific share of applications to that destination. Regarding processing times, an increase of 1 month in the processing time at a destination for applications from a particular origin is associated with a decline in the origin-specific share of applications to that destination of 2 per cent.

The first data column in Table 3 does not include the repatriation risk because we only have observations at the yearly level, which we fear it might not be enough to identify a linear effect in the model. We see that this is the case in Column (2) in Table 3. Our proxy for the repatriation risk is not significant and its inclusion does not affect the coefficients of the other two policy variables. We still fail to see a correlation between recognition rates and asylum applications, perhaps because demand and supply factors get more conflated in

Table 3: Relationship between asylum applications and policies in the full sample

	<i>Dependent variable:</i>		
	log asylum applications $\ln(a_{jkt})$		
	(1)	(2)	(3)
Recognition Rate	-0.09 (0.07)	-0.08 (0.07)	0.28*** (0.09)
Processing Time	-0.02*** (0.00)	-0.02*** (0.00)	-0.00 (0.00)
Risk of Repatriation		-0.00 (0.00)	-0.00 (0.00)
Rec.Rate x Proc.Time			-0.04*** (0.00)
Observations	21,905	21,905	21,905
Adjusted $R^2$	0.92	0.92	0.92
Dyad FE	Yes	Yes	Yes
Origin-time FE	Yes	Yes	Yes
Destination-time FE	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ .

Source: Authors' elaboration on [EUROSTAT \(2020\)](#).

larger corridors, as all regressions are weighted by the number of applications, or else because the functional form is not the correct one to pick up the richness of the interactions among policy variables.

We introduce the interaction of the recognition rate and processing times in Column (3) of Table 3. In terms of the demand for asylum, we would expect this interaction to be negative, as the recognition rate should have a less positive effect whenever the processing

time is higher and the processing time should have a more negative effect for high recognition rates. This is what we find, as the interaction is both negatively significant and sizable. Notice that this result entails that an increase in the processing time modifies the origin composition of incoming first-time asylum applications, as negative effects associated to a higher processing time are magnified by a higher recognition rate. Thus, a higher processing time reduces (increases) the share of asylum applications that are received from countries with a high (low) recognition rate, thus reducing (increasing) the average recognition rate.

Recall that Table 3 includes destination-month, origin-month and origin-destination dummies. It is interesting to understand what these dummies are controlling for, at least partially. In particular, we check whether destination-time dummies are correlated with economic conditions at destination: GDP and the consumer price index (CPI).<sup>10</sup> To this end, we take the destination-time dummies from our specifications in Table 3, average them across quarters and then run a regression of these dummies on the log of the GDP and the log of the CPI. The results, shown in Appendix A.3, are a positive correlation with log GDP and a negative one with the log of the CPI. Both variables explain only around 9 per cent of the variation in the destination-time dummies, with most of this explanatory power coming from the GDP. Notice that destination-time dummies are supposed to pick up many other effects, in particular, destination-specific asylum policies. The correlation with the log of the GDP goes in the expected direction, though. The correlation with the CPI would indicate that asylum seekers are attracted by low price locations, which would not need to be the case, as Albert and Monràs (2021) found the opposite result for immigrant locations within countries.<sup>11</sup> To further control for differential effects of economic conditions across origins, we run versions of Table 3 where we control for interactions of the GDP and the CPI at destination with origin fixed effects. Some of our coefficients lose precisions but the results are basically the same, as it can be seen in Tables A.6-A.8 in the Appendix A.3.

In Table 4, we provide specifications that check the heterogeneity of our results with respect to our proxy for the repatriation risk. Column (1) presents the results for origin-destination-month triplets characterized by a high repatriation risk in the previous year, whereas Column (2) shows what happens when the repatriation risk in the previous year

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<sup>10</sup>We thank an anonymous Referee for this suggestion.

<sup>11</sup>This ambiguity stems from the fact that refugees, and migrants in general, often remit a large portion of their incomes to household or family members left behind at origin, and thus they do not entirely consume their incomes at destination.

was below the median. The recognition rate has a positive and significant effect on asylum applications, but this positive effect is decreasing as the processing time increases. The interaction effect is always negative and large (in absolute terms) when the repatriation risk is low.

Table 4: Relationship between asylum applications and policies in the full sample. Heterogeneity by repatriation risk levels

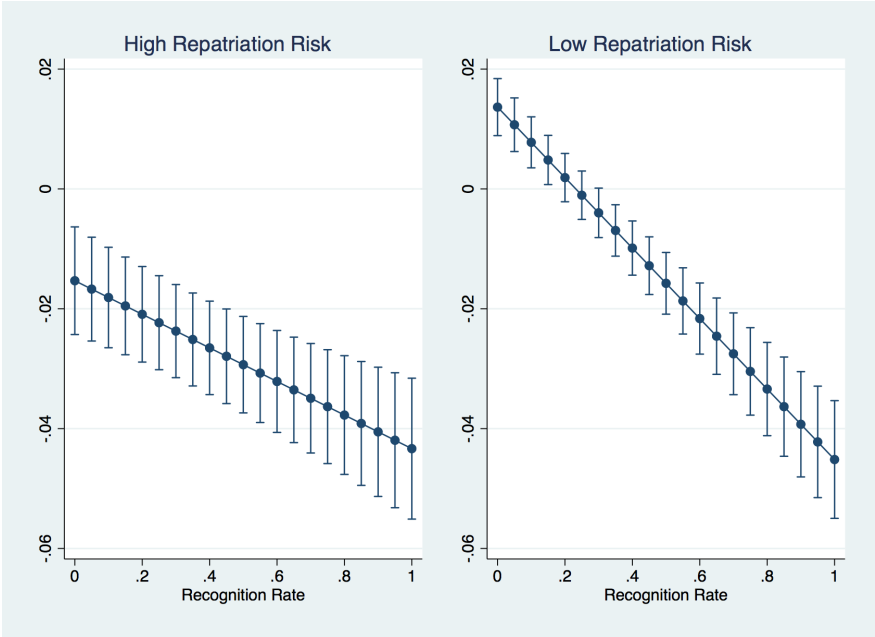
<i>Repatriation risk</i>	<i>Dependent variable:</i> log asylum applications $\ln(a_{jkt})$	
	High (1)	Low (2)
Recognition rate	0.14 (0.11)	0.61*** (0.10)
Processing time	-0.02*** (0.00)	0.01*** (0.00)
Rec. rate $\times$ proc. time	-0.03*** (0.01)	-0.06*** (0.01)
Observations	11,615	10,290
Adjusted- $R^2$	0.92	0.94
Dyad FE	Yes	Yes
Origin-time FE	Yes	Yes
Destination-time FE	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ . Columns (1) and (2) report estimates based on a sample restricted respectively to observations corresponding to a high and to a low repatriation risk  $q_{jkt}$ ; high repatriation risk defined as repatriation risk above the weighted median (1.46) in the previous year.

Source: Authors' elaboration on [EUROSTAT \(2020\)](#).

A surprising result from the point of view of our theory on the demand for asylum comes from the coefficient on the processing time. For low recognition rates, processing times have a negative and significant effect on applications only when the repatriation risk is high. When the repatriation risk is low, however, the effect of the processing time becomes positive. The estimates reported in Column (2) in Table 4 entail that the marginal effect of the processing time on the share of first-time asylum applications is positive when the recognition rate is below 17 per cent. Figure 3 plots the average marginal effect on the share of asylum applications from the regressions in Columns (1) and (2) of Table 4 for observations above (left) and below (right) the median risk of repatriation. Absent the threat of repatriation and for low recognition rates, a long processing time is associated with an increase in applications. To put it differently, when chances of being granted refugee status are low and the risk of repatriation is also moderate, lodging an asylum application becomes a (temporary) legal migration scheme.

Figure 3: Marginal Effect of Processing Times on the Share of Asylum Applications



Notes: The bars represent the 95 per cent confidence intervals around the average marginal effect.  
 Source: Estimates in Columns (1) and (2) of Table 4.

## 5.2 Robustness checks

The estimates presented in Tables 3 and 4 are robust to two relevant variations in the specifications that we bring to the data, as described below: more accurate data for Germany and alternative definitions of the repatriation risk. They are also robust to restricting the sample to a period that can be considered less exceptional than 2015-2016: 2009-2013 (not shown but available upon request).

### 5.2.1 EASY data for Germany

Although Germany received 42.5 per cent of all the first-time asylum applications lodged in European Union countries between 2014 and 2016 according to EUROSTAT figures, these are actually underestimating the German share at the beginning of this period. This is due to the fact that asylum seekers were not able, due to binding constraints on administrative capacity, to lodge their applications, and Germany accumulated an important backlog of applications in 2014 and 2015, which was then cleared in 2016. Thus, we replace the dependent variable in the econometric analysis for Germany over this period, switching from EUROSTAT to figures coming from the EASY system. Table 5 shows that our results are robust to such a change in the dependent variable for our main recipient country between 2014 and 2016. Similarly, our results are robust to simply dropping the largest corridor in the sample: that of Syrian applications in Germany (not shown but available upon request).

### 5.2.2 Alternative proxies for the risk of repatriation

EUROSTAT also provides information on the third-country nationals that have received an order to leave or have been found illegally present. We can replace the data on the number of third-country nationals that have been returned following an order to leave with either of the two series when building our proxy for the risk of repatriation, and our results are fully robust to such a change, as shown in Table 6.

## 5.3 Simple simulation results for processing times

We interpret the results from Table 4 as a correlation between the various policy measures and the share of asylum applications directed from an origin  $j$  to a destination  $k$  in period  $t$ , i.e.,  $a_{jkt}/a_{jt}$ . They are not directly informative about the total number of applications,

Table 5: Relationship between asylum applications and policies in the full sample. Heterogeneity by repatriation risk levels. Replacing Germany EUROSTAT data with EASY data between January 2014 and November 2016

<i>Repatriation risk</i>	<i>Dependent variable:</i> log asylum applications $\ln(a_{jkt})$	
	High (1)	Low (2)
Recognition rate	0.27** (0.13)	0.47*** (0.11)
Processing time	-0.01** (0.01)	0.01*** (0.00)
Rec. rate $\times$ proc. time	-0.04*** (0.01)	-0.05*** (0.01)
Observations	10,479	10,410
Adjusted- $R^2$	0.94	0.95
Dyad FE	Yes	Yes
Origin-time FE	Yes	Yes
Destination-time FE	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from a given origin. Columns (1) and (2) report estimates based on a sample restricted respectively to observations corresponding to a high and to a low repatriation risk  $q_{jkt}$ ; high repatriation risk defined as repatriation risk above the weighted median (1.63) in the previous year.

Source: Authors' elaboration on EUROSTAT, various series, and EASY registration system.

i.e.,  $a_{jkt}$ . In order to gauge the quantitative relevance of our estimates, we use the actual changes in processing times that were recorded in the different recipient countries between



Table 6: Alternative definitions of the risk of repatriation

<i>Dependent variable:</i>				
log asylum applications $\ln(a_{jkt})$				
<i>Definitions:</i>	Illegally present		Ordered to leave	
<i>Repatriation risk</i>	High	Low	High	Low
	(1)	(2)	(3)	(4)
Recognition rate	-0.00 (0.13)	0.44*** (0.10)	0.13 (0.15)	0.33*** (0.09)
Processing time	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.01*** (0.00)
Rec. rate $\times$ proc. time	-0.04*** (0.01)	-0.05*** (0.01)	-0.04*** (0.01)	-0.04*** (0.01)
Observations	10,645	12,878	10,964	11,152
Adjusted- $R^2$	0.94	0.93	0.92	0.94
Dyad FE	Yes	Yes	Yes	Yes
Origin-time FE	Yes	Yes	Yes	Yes
Destination-time FE	Yes	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Weights given by the total number of asylum applications into Europe in a given month from that particular citizenship. Columns (1)-(2) and Columns (3)-(4) report estimates based on a sample restricted respectively to observations corresponding to a high and to a low repatriation risk; high repatriation risk defined as repatriation risk above the weighted median in the previous year.

Source: Authors' elaboration on EUROSTAT, various series.

the onset of the surge, in January 2014, and its peak, in October 2015, as shown in Figure 1. We then assume that the coefficients in Table 4 identify the demand for asylum and rely on the micro-foundations of the gravity equation provided in Section 2.1.2 to simulate the origin-destination specific number of asylum applications in October 2015 if the processing time had remained unchanged at the (dyadic-specific) levels recorded in January 2014 in

all destination countries. For Germany and for the rest of Europe, the average processing time was broadly similar in October 2015, 9.4 and 8.6 months respectively, but the values recorded at the beginning of the previous year were markedly different: 15.7 months for Germany and 6.7 months for the other European countries. Our estimates entail that, if these values had prevailed also in October 2015, Germany would have received 37,794 more applications, rather than the 43,715 increase it actually recorded with respect to the baseline (January 2014). In other words, the decline in the processing time resulted in around 6,000 more applications, or 13.5 per cent of the increase actually observed in the data. For the other European countries, the simulation implies that flows were 7.9 per cent lower than what they would have been with unchanged processing times. For Syrians, the proposed back-of-the-envelope calculation means that the changes in processing time (down from 8.0 to 4.0 months for this specific origin in Germany) increased applications to Germany by 16.1 per cent, while reducing applications lodged in Sweden, where the processing times for Syrians had increased from 3.0 to 10.0 months, by a substantial 35.3 per cent. We focus on Sweden and Germany because they shared their top three origin countries for applications in 2014-2016. Syria was the main origin for asylum seekers in both countries, in contrast to Italy, where Syrians were only the 19<sup>th</sup> origin in terms of total number of applications.

A large share of the action is due to the change in the processing time in Germany alone: if we only fix the processing time at its January 2014 level for Germany, this suffices to explain 7.5 per cent of the increase in the total number of applications to Germany, compared to 13.5 per cent when freezing the processing time in all European destinations, as reported above.

## 6 Effects of lists of safe countries of origin

In this section, we move away from the analysis of the correlations between our policy measures and flows of asylum seekers and study the effect of one particular policy: the inclusion of a country in a list of safe countries of origin.<sup>12</sup> We take advantage from the dataset gathered by [Guichard \(2020\)](#), which he was kind enough to share with us. His definition of the safe countries of origin is ([Guichard, 2020](#), p. 122):

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<sup>12</sup>We thank the Editor and one anonymous Referee for suggesting this analysis.

The concept of safe source country is a presumption that certain countries can be defined as being safe for their nationals to the extent that “it can be shown that there is generally and consistently no persecution as defined in Article 9 of Directive 2004/83/EC, no torture or inhuman or degrading treatment or punishment and no threat by reason of indiscriminate violence in situations of international or internal armed conflict.” Source: Annex II of the Asylum Procedure Directive on the “Designation of safe countries of origin for the purposes of Articles 29 and 30(1).”

In practical terms, this implies that applications from these origins can be considered unfounded and they would give rise to faster negative decisions. In terms of our policy measures, the designation of an origin country as safe should imply lower recognition rates and processing times, with an ambiguous effect on the repatriation risk, given that both the numerator and the denominator are likely to increase.

There are many actual policies that can affect asylum seekers’ choices. For Germany alone, we described at least 68 policy variables, including announcements of law changes, the law changes themselves, German military and police missions and other incentives for migration, such as advertising campaigns, just for the period 2014-2016. Out of these, only 22 had variation by origin country, and only 2 affected more than one origin at different points in time: the list of safe countries of origin and the use of written questionnaires to determine the refugee status of some origins, which meant basically a recognition rate of 100 per cent. The difficulty lies in coding all of these changes homogeneously for a group of countries so that an empirical analysis of their effects is feasible. The lists of safe countries of origin changed frequently enough during our sample period to perform such an analysis.

Guichard (2020) provided us with lists of safe countries of origins for six destinations. These are Austria, Belgium, France, Germany, the Netherlands and the United Kingdom. They account for roughly two thirds of the asylum applications in our sample. It is unclear whether the rest of European countries may have similar lists that are not made public. For example, Guichard (2020) mentions this could be the case for Denmark and, perhaps, Italy. The estimates that we present below assume that the other 26 destinations in our datasets do not have lists of safe countries of origin. The results are qualitatively identical, but typically of a smaller magnitude, from the ones that we find when we restrict our sample to the six European countries mentioned above. Overall, these six destination introduced 26 changes over our period of analysis to their lists of safe countries of origin, 20 times adding an origin country to the list, and six times removing it.

## 6.1 Triple differences-in-differences with homogeneous effects

We first run a simple triple differences-in-differences specification:

$$y_{jkt} = \pi \text{sco}_{jkt} + d_{jk} + d_{jt} + d_{kt} + \eta_{jkt}, \quad (7)$$

Our main dependent variable is the log of asylum applications ( $\ln a_{jkt}$ ), but we also look at the effect of the list of safe countries of origin on our policy measures: recognition rates, processing times and repatriation risks.  $\pi$  can be interpreted as a triple difference estimator: differences over time, origins and destinations. If we assume parallel trends,  $\pi$  could identify the effect of the list of safe countries of origin on asylum applications or any of our three policy measures. The dummy variable  $\text{sco}_{jkt}$  takes value 1 when country of origin  $j$  is included in a list of safe countries of origin for destination  $k$  at time  $t$ .

The results from running Eq. (7) are presented in Table 7. Column (1) estimates the effect of the inclusion in the list on the log of asylum applications. It shows that appearing in the list is associated with a decrease of 15 per cent in applications. This is smaller than the 30 per cent decrease reported by Guichard (2020), but, in addition to having a different sample both in time (more years) and space (full OECD as destination countries), he controlled for multilateral resistance to migration. When we control for multilateral resistance to migration as well, using the common correlated effects estimator proposed by Pesaran (2006), our estimates move to a decrease of 31 per cent, almost identical to the result in Guichard (2020). These results can be found in Table A.3 in the Appendix A.2.

In Column (2), we report the effects of the lists over the recognition rate, which is not significant. This is at odds with our theoretical expectation but it might be reflecting compositional changes in the flows of asylum seekers, meaning that the credentials of the fewer asylum seekers attracted are higher once the origin enters the list.

In terms of processing times, in Column (3), we also find a zero effect. Guichard (2020) did find a negative and significant effect in this case. Similarly, for the repatriation risk, Column (4) shows an insignificant coefficient.

In Table 8, we look at the heterogeneity by repatriation risk by splitting the sample, that is, we run equation (7) separately in high repatriation risk and low repatriation risk corridors.

First, Columns (1) and (2) in Table 8 show opposite effects of being included in the list, depending on the level of the repatriation risk. In high repatriation risk corridors, the lists

Table 7: List of safe countries of origin and outcomes in the full sample

	<i>Dependent variable:</i>			
	$\ln(a_{jkt})$	Rec. Rate	Proc. Time	Rep. Risk
	(1)	(2)	(3)	(4)
List of Safe Countries of Origin	-0.15** (0.07)	0.00 (0.01)	0.03 (0.32)	-1.10 (0.78)
Observations	21,905	21,905	21,905	21,905
Adjusted- $R^2$	0.92	0.89	0.75	0.75
Dyad FE	Yes	Yes	Yes	Yes
Origin-time FE	Yes	Yes	Yes	Yes
Destination-time FE	Yes	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ .

Source: Authors' elaboration on [EUROSTAT \(2020\)](#) and on the data on lists of safe countries of origin from [Guichard \(2020\)](#).

lead to an increase in applications by 78 per cent. In low repatriation risk corridors, we see the expected decrease in applications by 74 per cent. What could explain this divergence? A candidate would be the differential effect of the list of safe countries of origin over recognition rates and processing times in these corridors. We see in Column (3) that the inclusion in the list does not affect the recognition rate in high risk corridors, but it does reduce recognition rates by 5 percentage points in low risk corridors in Column (4), which would contribute to the decrease in asylum applications from Column (2). The opposite takes place with respect to processing times. The list of safe countries of origin only reduces processing times by 1.4 months in high repatriation risk corridors in Column (5), while we see no association in low repatriation risk corridors in Column (6). Summing up, it would be consistent with the theory that a reduction of processing times in high repatriation risk corridors would lead to an increase in the attractiveness of these destinations and to a surprising increase in asylum

Table 8: List of safe countries of origin and outcomes by repatriation risk

<i>Repatriation Risk</i>	<i>Dependent variable:</i>					
	$\ln(a_{jkt})$		Rec. Rate		Proc. Time	
	High	Low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)
List of Safe Countries of Origin	0.78*** (0.13)	-0.74*** (0.10)	-0.01 (0.01)	-0.05*** (0.01)	-1.39*** (0.38)	0.09 (0.41)
Observations	11,615	10,290	11,615	10,290	11,615	10,290
Adjusted- $R^2$	0.92	0.94	0.90	0.91	0.79	0.79
Dyad FE	Yes	Yes	Yes	Yes	Yes	Yes
Origin-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Destination-time FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Weights given by the total number of applications  $a_{jt}$  into Europe in a given month from the origin  $j$ .

Source: Authors' elaboration on EUROSTAT (2020) and data on lists of safe countries of origin from Guichard (2020).

applications. However, in low risk corridors we would have the expected decrease both in recognition rates and in applications. What remains to be explained is why the list of safe countries of origin has so different effects in high and low repatriation risk corridors.

## 6.2 Event study and parallel trends in the staggered sample

The causal interpretation of the results in Tables 7 and 8 is not immediate, as we should verify that the control group of bilateral asylum corridors that were not subject to the inclusion in lists of safe countries of origin had parallel trends. To this end we run the following specification as an extension of Eq. (7):

$$y_{jkt} = \sum_{\tau=-K}^{-2} \rho_{\tau} \mathbb{I}(\text{sco}_{jkt\tau}) + \sum_{\tau=0}^M \pi_{\tau} \mathbb{I}(\text{sco}_{jkt\tau}) + d_{jk} + d_{jt} + d_{kt} + \eta_{jkt}, \quad (8)$$

where  $\mathbb{I}(\text{sco}_{jkt\tau})$  is an indicator that takes value 1 if  $\text{sco}_{jkt}$  changed from 0 to 1  $\tau$  months before month  $t$ . The  $M$  lags and  $K$  leads span all the possible lags and leads in the data

(90 lags and 93 leads) although only 10 leads and 20 lags will be represented in the figures below. Eq. (8) is also estimated with weighted observations.

Some of the changes (6 overall) in our lists of safe countries of origin refer to exclusions from the list and they would not fit in equation (8). We exclude these 6 corridors from the analysis to create a staggered sample in which entering into a list of safe countries of origin is an absorbing state. This way, our number of observations goes down from 21,905 to 21,296 and we are left with only 15 out of 26 policy changes.

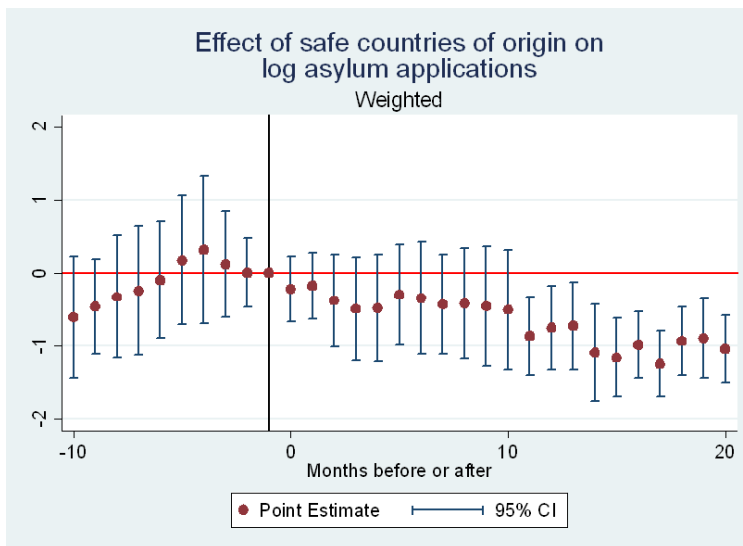
Figure 4 plots the coefficients from estimating equation (8) on the staggered sample and having the log of asylum applications as the dependent variable. We use the command `eventdd` in Stata (Clarke and Schythe, 2020). We find a drop in the number of applications that becomes significant 11 months after the inclusion in the list. The magnitude of the effect is larger than the average one detected in Column (1) of Table 7 because the average aggregates over 10 months where the effect is much smaller and non-significant. Parallel trends formally hold over the previous 12 periods, which would allow us to interpret the results causally. However, we can observe a worrying pre-trend: it seems that applications are on the rise in the months that predate the inclusion of an origin country in the list. In fact, the parallel trends assumption breaks if we increase the number of leads beyond one year. This could be consistent with an adoption of these lists as a response to larger asylum flows, but the evidence is not conclusive.

In addition to the number of asylum applications, Eq. (8) can also be estimated for our policy measures, even if none of them came out significant in the triple differences specification in Table 7. In the case of recognition rates, we observe some positive significant effects both before and after the policy is implemented but there is not a discernible pattern. For processing times, standard errors are too large to detect any significance before or after the implementation of the policy.<sup>13</sup>

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<sup>13</sup>We could also think of running event study specifications by levels of repatriation risk, as in Table 8. The problem with this approach would be that we would have corridors going in and out of the sample in different years. We explain an example in the On-line Appendix.

Figure 4: Event Study Representation of the Effect of the List of Safe Countries of Origin on Log Asylum Applications



Notes: Estimates from Eq. (8) on the staggered sample, which drops the corridors between France and Albania, Bangladesh, Georgia, Mali, Turkey and Ukraine. The bars represent the 95 per cent confidence intervals around leads and lags. Standard errors clustered by origin-month. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ .

Source: Authors' elaboration on EUROSTAT (2020) and on the data on the lists of safe countries of origin from Guichard (2020).

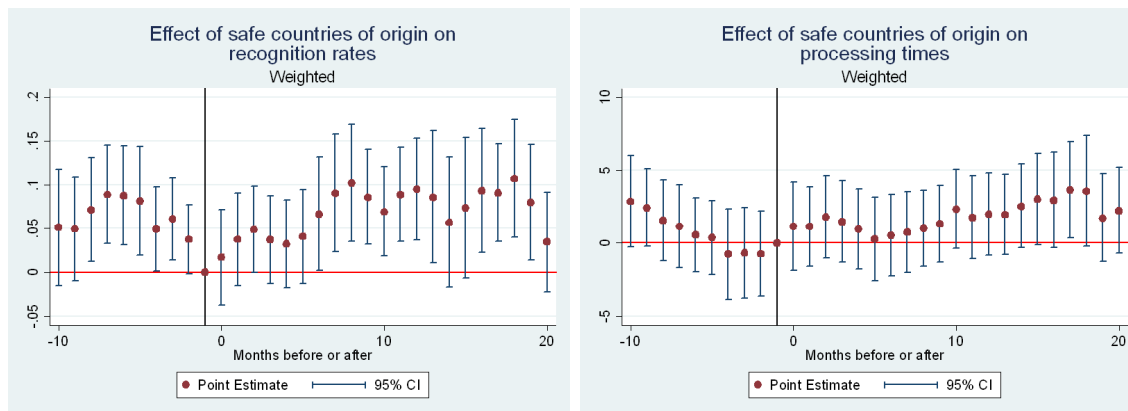
### 6.3 Differences-in-differences in the full sample with heterogeneous and dynamic effects

However interesting the patterns uncovered by Eq. (8) and Figures 4 and 5, it can be considered wasteful to leave out 11 of the 26 changes in the list of safe countries of origin that took place during our studied period when we restrict our analysis to the staggered sample.

For example, we are not using the variation generated by the entry and exit of Albania from the French list of safe countries of origin, the corridor with the largest number of changes in our dataset. Figure 6 shows that this variation could indeed be informative about any type of effect. Albania entered the list for the first time in our sample period in March of 2011, it went out a year later in April 2012 and came back for the rest of our analysis in



Figure 5: Event Study Representation of the Effect of the List of Safe Countries of Origin on Recognition Rates and Processing Times



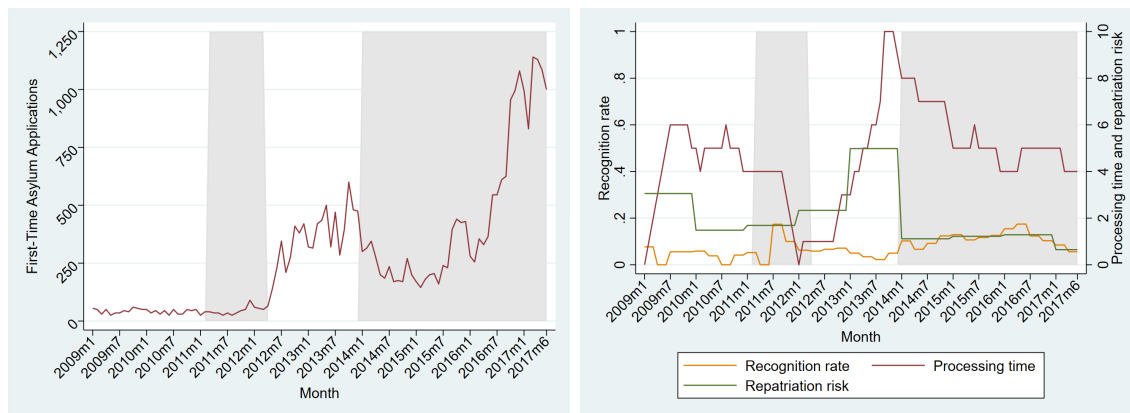
Notes: Estimates from Eq. (8) on the staggered sample, which drops the corridors between France and Albania, Bangladesh, Georgia, Mali, Turkey and Ukraine. The bars represent the 95 per cent confidence intervals around leads and lags. Standard errors clustered by origin-month. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ .

Source: Authors' elaboration on EUROSTAT (2020) and data on lists of safe countries of origin from Guichard (2020).

January 2014. The first entry in 2011 did not seem to have a visual effect on applications although the processing time went down from 4 months to 0-1. The exit in 2012 coincided with a rise in asylum application, together with increases in processing times, which rose to 10 months, and in repatriation risks. The new entry of Albania in the list of safe countries of origin in 2014 led to a drop in applications, processing times and repatriation risks. Asylum applications went up again in 2016, but this time it did not happen at the same time as any change in the list of safe countries of origin or in the other policy measures.

The case of Albanians in France shows both that there is interesting variation that we miss in a purely staggered design and that there can be a lot of heterogeneity that would be masked either in our triple differences estimates or in the simple event study designs. Despite the burgeoning literature on differences-in-differences specifications that deals with heterogeneity and dynamic treatment effects (Sun and Abraham, 2021; Goodman-Bacon, 2021; Callaway and Sant'Anna, 2021; de Chaisemartin and D'Haultfoeuille, 2020; Borusyak et al., 2021), to the best of our knowledge, only de Chaisemartin and D'Haultfoeuille (2021) provide a methodology that allows for a non-staggered design, with units going in and out

Figure 6: Evolution of Albanian First-Time Asylum Applications in France and Policy Measures by inclusion in the list of Safe Countries of Origin



Notes: Shaded areas represent the time during which Albania was in the French list of Safe Countries of Origin.

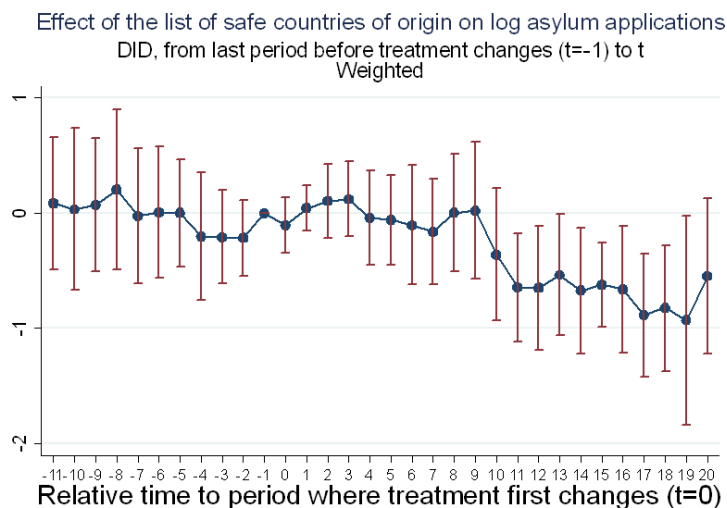
Source: Authors' elaboration on EUROSTAT (2020) and data on lists of safe countries of origin from Guichard (2020).

of treatment status, as in Figure 6.

The estimator proposed by de Chaisemartin and D'Haultfoeuille (2021) is able to use all the information in our full sample both to test for parallel trends through their placebo analysis and to compute treatment effects a number of periods after the establishment of the policy. Figure 7 represents the results of this estimator for the effect of the list of safe countries of origin on log asylum applications. Our full baseline sample (21,905 observations) is used in the estimation. First, we observe that the weighted aggregation of differences-in-differences estimates that de Chaisemartin and D'Haultfoeuille (2021) propose to test for pre-trends or anticipation effects in the period leading to the policy change are not statistically different from zero for a year before treatment. Figure 7 shows estimates from a simple specification with just time and panel (dyad) fixed effects, but the results are robust to controlling non-parametrically for origin-month and destination-month fixed effects.

Second, we observe in Figure 7 a large drop in asylum applications 10 to 11 months after the inclusion in the list. The point estimates are well below 50 per cent, but the confidence intervals are quite large. Thus, on average, the lists of safe countries of origin managed to fulfill its aim of significantly reducing asylum applications in the corridors where they were

Figure 7: Representation of the Effect of the List of Safe Countries of Origin on Log Asylum Applications with the Estimator of de Chaisemartin and D’Haultfoeuille (2021)



Notes: Estimates from Stata command `did_multipligt` (see de Chaisemartin et al., 2019) on the full sample: 21,905 observations. The bars represent the 95 per cent confidence intervals around long difference effects and placebo tests. Standard errors clustered by origin-month based on 100 bootstrap replications. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ . Source: Authors’ elaboration on EUROSTAT (2020) and data on lists of safe countries of origin from Guichard (2020).

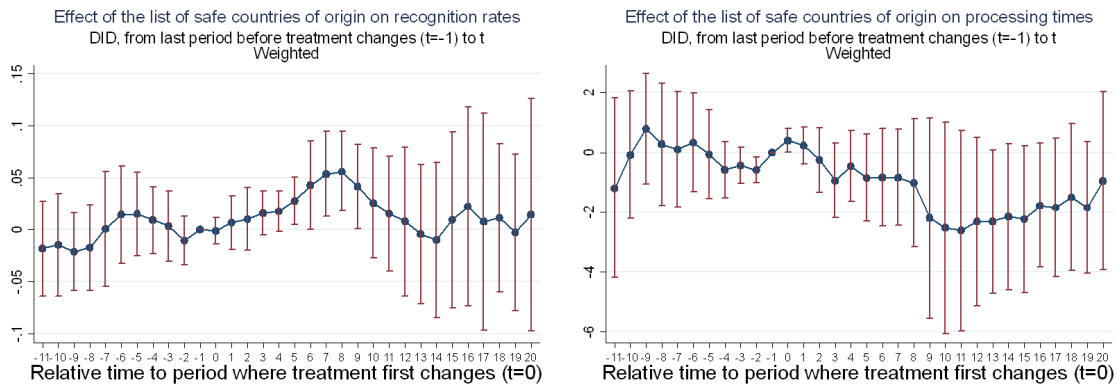
implemented.

This negative effect could only work through our policy measures if recognition rates were to drop significantly, since the list of safe countries of origins is a policy that is meant to reduce processing times, and we see a negative correlation of processing times with asylum applications. To see whether this is the case, we repeat the procedure in de Chaisemartin and D’Haultfoeuille (2021) in Figure 8, but this time with recognition rates and processing times as our dependent variables. Figure 8 shows only specifications without controls. Adding origin-time or destination-time controls does not alter the results (not shown but available upon request).

Contrary to our expectations, but in line with estimates in Figure 5, we see a temporary increase of up to 5 percentage points in recognition rates between 5 and 9 months after the inclusion in the list of safe countries of origin. As mentioned above, this could be related

to a change in the composition of applicants, with high-credential applicants remaining in the pool and obtaining higher recognition rates. We also see that parallel trends and no anticipation effects are confirmed in the placebo tests for up to a year before treatment.

Figure 8: Representation of the Effect of the List of Safe Countries of Origin on Recognition Rates and Processing Times with the Estimator of de Chaisemartin and D’Haultfoeuille (2021)



Notes: Estimates from Stata command `did_multiplert` (see de Chaisemartin et al., 2019) on the full sample: 21,905 observations. The bars represent the 95 per cent confidence intervals around long difference effects and placebo tests. Standard errors clustered by origin-month based on 100 bootstrap replications. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ . Source: Authors’ elaboration on EUROSTAT (2020) and data on lists of safe countries of origin from Guichard (2020).

For processing times, the estimates in Figure 8 instead show anticipation effects for 2 months before the policy is implemented. Processing times slightly go down before the inclusion in the list of safe countries of origin. This potential anticipation effect is much smaller than the large negative effect that the point estimates reveal 9 months after the policy, with processing times going down on average by up to 2 months. This effect has large confidence intervals and it is not significant. However, it is significant with unweighted estimates (see On-line Appendix), which hints at it being driven mostly by low intensity corridors.

The analysis of the lists of safe countries of origin in our dataset provides us with one example of a policy that we can identify and that significantly affected asylum application

choices in Europe. We could also see how this policy is related to the equilibrium policy measures that we used both in our theory and in our previous empirical exercises. We confirm the relevance of the interaction of policies and the proper consideration of heterogeneity in order to understand asylum seekers' choices.

## 7 Concluding remarks

The number of asylum applications received by European countries appears to be significantly correlated with variations in some of the key facets of uncertainty facing asylum seekers, namely the recognition rate, the expected processing time, and the risk of repatriation for those who are denied refugee protection. While the recognition rate is primarily reflecting origin-specific time-varying conditions, the expected processing time and the risk of repatriation largely appear as the by-product of deliberate policy measures taken by the countries of destination, concerning notably the resources that are allocated to processing pending asylum applications, the (implicit or explicit) priorities that are set with respect to the processing of applications from various origins, and the resources allocated to the enforcement of immigration legislation. These factors are significantly associated to the number of asylum applications that a country receives, as well as to the composition by country of origin of the asylum applications that are lodged.

Germany invested heavily in its administrative capacities around 2015, and it introduced policies to ensure a faster processing of asylum applications. The rationale of these policies was, on the one hand, to facilitate integration of asylum seekers with good prospects to stay and, on the other hand, to repatriate faster asylum seekers with low approval chances. As our findings demonstrate, these policies have increased the attractiveness of Germany as a destination for applicants stemming from origins that are heavily affected by violent conflicts and persecution and who could easily substantiate their asylum claims. Overall, these policies are associated with increases in the number of asylum applications in Germany by 13.5 percent and thus may have contributed significantly to the 400,000 applications Germany received in 2015 and 2016, while reducing the applications lodged in Sweden.

Due to the heterogeneity in the types of actual asylum policies that European countries implement, most of our empirical exercises take advantage from correlations in equilibrium outcomes, which can only be interpreted with the help of a model that differentiates the

demand for and the supply of asylum. We complement this analysis with a more in-depth identification of the effects of one particular policy on asylum applications: the inclusion of particular origins in lists of safe countries of origin in different destinations at different points in time. We see how this particular policy did indeed significantly reduce asylum applications in Europe while contributing to faster processing times.

There is a large theoretical literature ([Fernández-Huertas Moraga and Rapoport, 2014](#); [des Places and Deffains, 2003](#); [Hatton, 2014](#)) and lots of political efforts on the need to coordinate government policies to respond to inflows of asylum seekers. From an efficiency point of view, the theory suggests that policies should be coordinated to avoid races to the bottom in refugee protection standards. The 1951 Refugee Convention is already a coordination policy for recognition rates and the European Union has modulated a common policy on processing times over the years. By showing that asylum seekers do indeed respond to differentials in recognition rates and processing times, this paper demonstrates that there is indeed an externality that some countries impose on others when they set up their policies unilaterally. Given that some of the empirical estimates that control for multilateral resistance to migration are not far from the ones that do not, our results would not suggest that this externality is very large, but this could be happening either because we focus on origin-destination specific policies or because the existing European efforts for coordination have been, to some extent, successful.

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# A On-line Appendix for “Do applications respond to changes in asylum policies in European countries?,” by Simone Bertoli, Herbert Brücker and Jesús Fernández-Huertas Moraga

## A.1 Theoretical framework

### A.1.1 Demand for asylum: expected utility assumptions

Let  $p$  denote the probability of acceptance of an asylum application, and  $z$  represent the time required to process the asylum application. We omit time and country of origin and destination subscripts to avoid cluttering the notation. Let  $u_1$  denote the instantaneous level of utility while the demand is processed,  $u_2$  the utility if the demand is accepted and  $u_3$  the utility after the demand is rejected. We can assume that  $u_2 > u_1 > u_3$ . Notice that the instantaneous utility  $u_3$  can be thought of as a weighted average of the utility that an asylum seeker that is denied refugee status can obtain while overstaying at the destination as an undocumented migrant and the utility in the case of repatriation to her origin country, and we denote with  $q$  the risk of repatriation for applicants that are denied refugee status, so that  $u_3$  is negatively related to  $q$ , i.e.,  $\partial u_3 / \partial q < 0$ .

For simplicity, assume that agents have one unit of lifetime that they divide in two parts:  $z$  is the share of their lifetime that takes place while their application is being processed, during which they obtain utility level  $u_1$ ;  $1 - z$  is the share of lifetime after their application has been processed, when they get an expected utility that is equal to a weighted average of utility when their application is accepted ( $u_2$ ) and utility when it is rejected ( $u_3$ ), with weights given by the recognition rate  $p$  and  $1 - p$ .

Hence, the *ex ante* expected utility  $U$  is given by:

$$U = zu_1 + (1 - z)[pu_2 + (1 - p)u_3]$$

We thus have:

$$\frac{\partial U}{\partial p} = (1 - z)(u_2 - u_3) > 0$$

The effect of the recognition rate  $p$  is unambiguously positive, as  $u_2 > u_3$  (the utility when the demand is accepted is higher than the utility when the demand is rejected). If we consider

the partial derivative with respect to the processing time  $z$  we obtain:

$$\frac{\partial U}{\partial z} = u_1 - [pu_2 + (1 - p)u_3]$$

The sign of  $\partial U/\partial z$  is ambiguous, and it is negative if:

$$p > \frac{u_1 - u_3}{u_2 - u_3}$$

Notice that this threshold is always larger than 0, as we have assumed that  $u_1 > u_3$  (numerator) and  $u_2 > u_3$  (denominator), and smaller than 1, as we have assumed that  $u_2 > u_1$ . Furthermore, the higher the risk of repatriation  $q$ , the lower is  $u_3$ , and thus the higher the value of the recognition rate  $p$  at which the marginal effect of the processing time  $z$  on  $U$  changes sign.

The cross-derivative of expected utility  $U$  with respect to the recognition rate  $p$  and the processing time  $z$  is given by:

$$\frac{\partial^2 U}{\partial p \partial z} = -(u_2 - u_3) < 0$$

The cross-derivative of expected utility  $U$  with respect to the processing time  $z$  and the risk of repatriation  $q$  is given by:

$$\frac{\partial^2 U}{\partial z \partial q} = -(1 - p) \frac{\partial u_3}{\partial q} > 0$$

Thus, the effect of the processing time  $z$  is higher when the repatriation risk  $q$  is higher.

### A.1.2 Supply of asylum: marginal cost assumptions

Let  $c_1$  denote the marginal cost while the asylum application is processed,  $c_2$  the marginal cost if the application is accepted and  $c_3$  the marginal cost after the application is rejected. We can assume that  $c_1 < c_3$ , while other relationships are left unspecified. Notice that the marginal cost  $c_3$  can be thought of as a weighted average of the marginal cost imposed by an asylum seeker that is denied refugee status and overstays at the destination as an undocumented migrant and the marginal cost in the case of repatriation to her origin country, and we denote with  $q$  the risk of repatriation for applicants that are denied refugee status. We can assume that  $c_3$  is negatively related to  $q$ , i.e.,  $\partial c_3/\partial q < 0$ .

Hence, the *ex ante* expected marginal cost  $C$  is given by:

$$C = zc_1 + (1 - z)[pc_2 + (1 - p)c_3]$$

We thus have:

$$\frac{\partial C}{\partial p} = (1 - z)(c_2 - c_3)$$

The effect of the recognition rate  $p$  is ambiguous, as it depends on the relationship between marginal costs  $c_2$  and  $c_3$ . It will only be positive if the marginal cost of accepting an asylum application is larger than the marginal cost of rejecting it. If we consider the partial derivative with respect to the processing time  $z$  we obtain:

$$\frac{\partial C}{\partial z} = c_1 - [pc_2 + (1 - p)c_3] = c_1 - c_3 - p(c_2 - c_3)$$

The sign of  $\partial C/\partial z$  is also ambiguous, but it will always be negative if  $\frac{\partial C}{\partial p} > 0$ , as that only happens if  $c_2 > c_3$  and we assumed that  $c_1 < c_3$ . Furthermore, the higher the risk of repatriation  $q$ , the lower is  $c_3$ , and thus it is more likely that  $\frac{\partial C}{\partial p} > 0$  and  $\frac{\partial C}{\partial z} < 0$  if the repatriation risk is high.

The cross-derivative of the expected marginal cost  $C$  with respect to the recognition rate  $p$  and the processing time  $z$  is given by:

$$\frac{\partial^2 C}{\partial p \partial z} = -(c_2 - c_3)$$

It will be negative as long as  $\frac{\partial C}{\partial p} > 0$  and  $\frac{\partial C}{\partial z} < 0$  because that only happens when  $c_2 > c_3$ .

The cross-derivative of the expected marginal cost  $C$  with respect to the processing time  $z$  and the risk of repatriation  $q$  is given by:

$$\frac{\partial^2 C}{\partial z \partial q} = -(1 - p) \frac{\partial c_3}{\partial q} > 0$$

Thus, the effect of the processing time  $z$  is larger when the repatriation risk  $q$  is higher.

## A.2 Multilateral Resistance to Migration

We show below how our main estimates in the paper change when we control for multilateral resistance to migration by using the common correlated effects estimator of [Pesaran \(2006\)](#).

Table A.1: Relationship between asylum applications and policies in the full sample controlling for multilateral resistance to migration

	<i>Dependent variable:</i>		
	log asylum applications $\ln(a_{jkt})$		
	(1)	(2)	(3)
Recognition Rate	0.12*** (0.04)	0.10*** (0.04)	0.25*** (0.05)
Processing Time	-0.01*** (0.00)	-0.01*** (0.00)	-0.00** (0.00)
Risk of Repatriation		0.00 (0.00)	0.00 (0.00)
Rec.Rate x Proc.Time			-0.02*** (0.00)
Observations	21,905	21,905	21,905
Adjusted $R^2$	0.89	0.89	0.90
Dyad FE	Yes	Yes	Yes
Origin-time FE	Yes	Yes	Yes
Destination-time FE	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ . All specifications control for dyad fixed effects interacted with cross-sectional averages of the dependent and independent variables, the common correlated effects estimator of [Pesaran \(2006\)](#).

Source: Authors' elaboration on [EUROSTAT \(2020\)](#).

Table A.2: Relationship between asylum applications and policies in the full sample controlling for multilateral resistance to migration

<i>Repatriation Risk</i>	<i>Dependent variable:</i>	
	$\ln(a_{jkt})$	
	High	Low
	(1)	(2)
Recognition Rate	-0.01 (0.11)	0.83*** (0.14)
Processing Time	-0.01** (0.00)	0.01*** (0.00)
Rec. Rate x Proc. Time	-0.01 (0.01)	-0.06*** (0.01)
Observations	11,615	10,290
Adjusted- $R^2$	0.96	0.97
Dyad FE	Yes	Yes
Origin-time FE	Yes	Yes
Destination-time FE	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ . All specifications control for dyad fixed effects interacted with cross-sectional averages of the dependent and independent variables, the Common Correlated Effects estimator by Pesaran (2006).

Source: Authors' elaboration on EUROSTAT (2020).



Table A.3: Relationship between the list of safe countries of origin and outcomes in the full sample controlling for multilateral resistance to migration

	<i>Dependent variable:</i>			
	$\ln(a_{jkt})$	Rec. Rate	Proc. Time	Rep. Risk
	(1)	(2)	(3)	(4)
List of Safe Countries of Origin	-0.31*** (0.07)	0.00 (0.01)	-0.34 (0.33)	0.19 (1.03)
Observations	21,905	21,905	21,905	21,905
Adjusted- $R^2$	0.93	0.91	0.80	0.82
Dyad FE	Yes	Yes	Yes	Yes
Origin-time FE	Yes	Yes	Yes	Yes
Destination-time FE	Yes	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ . All specifications control for dyad fixed effects interacted with cross-sectional averages of the dependent and independent variables, the Common Correlated Effects estimator by [Pesaran \(2006\)](#).

Source: Authors' elaboration on [EUROSTAT \(2020\)](#).

Table A.4: Relationship between the list of safe countries of origin and outcomes by repatriation risk controlling for multilateral resistance to migration

<i>Repatriation Risk</i>	<i>Dependent variable:</i>					
	$\ln(a_{jkt})$		Rec. Rate		Proc. Time	
	High	Low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)
List of Safe Countries of Origin	0.19 (0.24)	-0.55*** (0.11)	0.00 (0.02)	-0.05*** (0.02)	-0.88** (0.45)	0.92* (0.53)
Observations	11,615	10,290	11,615	10,290	11,615	10,290
Adjusted- $R^2$	0.95	0.96	0.93	0.93	0.84	0.85
Dyad FE	Yes	Yes	Yes	Yes	Yes	Yes
Origin-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Destination-time FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ . All specifications control for dyad fixed effects interacted with cross-sectional averages of the dependent and independent variables, the common correlated effects estimator of Pesaran (2006).

Source: Authors' elaboration on EUROSTAT (2020).

### A.3 The role of economic conditions at destination

Table A.5: Destination-month dummies and economic conditions at destination

*Dependent variable:*  
quarterly average of  
destination-month dummies

	(1)	(2)	(3)
$\ln(CPI_{kq})$	-2.18 (1.34)	-2.17 (1.34)	-2.22 (1.35)
$\ln(GDP_{kq})$	0.62*** (0.08)	0.61*** (0.08)	0.60*** (0.08)
Observations	664	664	664
Adjusted- $R^2$	0.09	0.09	0.09

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors in parentheses. The dependent variable is the average for quarter  $q$  of the destination-time dummies in the corresponding data column of Table 3. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ .

Source: Authors' elaboration on [EUROSTAT \(2020, 2021a,b\)](#).

Table A.6: Relationship between asylum applications and policies in the full sample controlling for interactions of the GDP at destination with origin dummies

	<i>Dependent variable:</i>		
	log asylum applications $\ln(a_{jkt})$		
	(1)	(2)	(3)
Recognition Rate	-0.11 (0.15)	-0.10 (0.14)	0.27* (0.15)
Processing Time	-0.02** (0.01)	-0.02** (0.01)	-0.00 (0.01)
Risk of Repatriation		-0.00 (0.00)	-0.00 (0.00)
Rec. Rate x Proc. Time			-0.04*** (0.01)
Observations	21,905	21,905	21,905
Adjusted- $R^2$	0.92	0.92	0.92
Dyad FE	Yes	Yes	Yes
Origin-time FE	Yes	Yes	Yes
Destination-time FE	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ . All specifications include interactions of the GDP at destination  $k$  with origin dummies.

Source: Authors' elaboration on [EUROSTAT \(2020, 2021b\)](#).

Table A.7: Relationship between asylum applications and policies in the full sample controlling for interactions of the CPI at destination with origin dummies

	<i>Dependent variable:</i>		
	log asylum applications $\ln(a_{jkt})$		
	(1)	(2)	(3)
Recognition Rate	-0.11 (0.15)	-0.11 (0.14)	0.25* (0.15)
Processing Time	-0.02** (0.01)	-0.02** (0.01)	-0.00 (0.00)
Risk of Repatriation		-0.00 (0.00)	-0.00 (0.00)
Rec. Rate x Proc. Time			-0.04*** (0.01)
Observations	21,905	21,905	21,905
Adjusted- $R^2$	0.92	0.92	0.92
Dyad FE	Yes	Yes	Yes
Origin-time FE	Yes	Yes	Yes
Destination-time FE	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ . All specifications include interactions of the CPI at destination  $k$  with origin dummies.

Source: Authors' elaboration on [EUROSTAT \(2020, 2021a\)](#).

Table A.8: Relationship between asylum applications and policies in the full sample controlling for interactions of the GDP and the CPI at destination with origin dummies

	<i>Dependent variable:</i>		
	log asylum applications $\ln(a_{jkt})$		
	(1)	(2)	(3)
Recognition Rate	-0.13 (0.15)	-0.12 (0.15)	0.23 (0.16)
Processing Time	-0.02** (0.01)	-0.02** (0.01)	-0.00 (0.01)
Risk of Repatriation		-0.00 (0.00)	-0.00 (0.00)
Rec. Rate x Proc. Time			-0.04*** (0.01)
Observations	21,905	21,905	21,905
Adjusted- $R^2$	0.92	0.92	0.92
Dyad FE	Yes	Yes	Yes
Origin-time FE	Yes	Yes	Yes
Destination-time FE	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ . All specifications include interactions of the GDP and of the CPI at destination  $k$  with origin dummies.

Source: Authors' elaboration on [EUROSTAT \(2020, 2021a,b\)](#).

## A.4 Unweighted specifications for the main text

Table A.9: Relationship between asylum applications and policies in the full sample. Unweighted version of Table 3

	<i>Dependent variable:</i>		
	log asylum applications $\ln(a_{jkt})$		
	(1)	(2)	(3)
Recognition Rate	0.17*** (0.03)	0.17*** (0.03)	0.45*** (0.05)
Processing Time	-0.01*** (0.00)	-0.01*** (0.00)	-0.00** (0.00)
Risk of Repatriation		-0.00 (0.00)	-0.00 (0.00)
Rec.Rate x Proc.Time			-0.03*** (0.00)
Observations	21,905	21,905	21,905
Adjusted $R^2$	0.84	0.84	0.84
Dyad FE	Yes	Yes	Yes
Origin-time FE	Yes	Yes	Yes
Destination-time FE	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses.

Source: Authors' elaboration on [EUROSTAT \(2020\)](#).

Table A.10: Relationship between asylum applications and policies in the full sample. Heterogeneity by repatriation risk levels. Unweighted version of Table 4

<i>Repatriation risk</i>	<i>Dependent variable:</i> log asylum applications $\ln(a_{jkt})$	
	High (1)	Low (2)
Recognition rate	0.36*** (0.07)	0.64*** (0.08)
Processing time	-0.02*** (0.00)	0.01*** (0.00)
Rec. rate $\times$ proc. time	-0.03*** (0.01)	-0.04*** (0.00)
Observations	11,615	10,290
Adjusted- $R^2$	0.83	0.89
Dyad FE	Yes	Yes
Origin-time FE	Yes	Yes
Destination-time FE	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Columns (1) and (2) report estimates based on a sample restricted respectively to observations corresponding to a high and to a low repatriation risk  $q_{jkt}$ ; high repatriation risk defined as repatriation risk above the weighted median (1.46) in the previous year.

Source: Authors' elaboration on EUROSTAT (2020).



Table A.11: Relationship between asylum applications and policies in the full sample. Heterogeneity by repatriation risk levels. Replacing Germany EUROSTAT data with EASY data between January 2014 and November 2016. Unweighted version of Table 5

<i>Repatriation risk</i>	<i>Dependent variable:</i> log asylum applications $\ln(a_{jkt})$	
	High (1)	Low (2)
Recognition rate	0.39*** (0.07)	0.62*** (0.07)
Processing time	-0.01*** (0.00)	0.01*** (0.00)
Rec. rate $\times$ proc. time	-0.04*** (0.01)	-0.04*** (0.00)
Observations	10,479	10,410
Adjusted- $R^2$	0.83	0.89
Dyad FE	Yes	Yes
Origin-time FE	Yes	Yes
Destination-time FE	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Columns (1) and (2) report estimates based on a sample restricted respectively to observations corresponding to a high and to a low repatriation risk  $q_{jkt}$ ; high repatriation risk defined as repatriation risk above the weighted median (1.63) in the previous year.

Source: Authors' elaboration on EUROSTAT, various series, and EASY registration system.

Table A.12: Alternative definitions of the risk of repatriation. Unweighted version of Table 6

		<i>Dependent variable:</i>			
		log asylum applications $\ln(a_{jkt})$			
<i>Definitions:</i>		Illegally present		Ordered to leave	
<i>Repatriation risk</i>		High	Low	High	Low
		(1)	(2)	(3)	(4)
Recognition rate		0.19*** (0.07)	0.52*** (0.07)	0.41*** (0.08)	0.43*** (0.07)
Processing time		-0.01** (0.00)	-0.00 (0.00)	-0.01*** (0.00)	0.00 (0.00)
Rec. rate $\times$ proc. time		-0.02*** (0.00)	-0.04*** (0.00)	-0.03*** (0.01)	-0.03*** (0.00)
Observations		10,645	12,878	10,964	11,152
Adjusted- $R^2$		0.87	0.86	0.82	0.89
Dyad FE		Yes	Yes	Yes	Yes
Origin-time FE		Yes	Yes	Yes	Yes
Destination-time FE		Yes	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses. Columns (1)-(2) and Columns (3)-(4) report estimates based on a sample restricted respectively to observations corresponding to a high and to a low repatriation risk; high repatriation risk defined as repatriation risk above the weighted median in the previous year. Source: Authors' elaboration on EUROSTAT, various series.

Table A.13: List of safe countries of origin and outcomes in the full sample. Unweighted version of Table 7

	<i>Dependent variable:</i>			
	$\ln(a_{jkt})$	Rec. Rate	Proc. Time	Rep. Risk
	(1)	(2)	(3)	(4)
List of Safe Countries of Origin	-0.11** (0.05)	0.02*** (0.01)	-0.88*** (0.25)	-1.40* (0.77)
Observations	21,905	21,905	21,905	21,905
Adjusted- $R^2$	0.84	0.79	0.70	0.63
Dyad FE	Yes	Yes	Yes	Yes
Origin-time FE	Yes	Yes	Yes	Yes
Destination-time FE	Yes	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses.

Source: Authors' elaboration on EUROSTAT (2020) and on the data on lists of safe countries of origin from Guichard (2020).

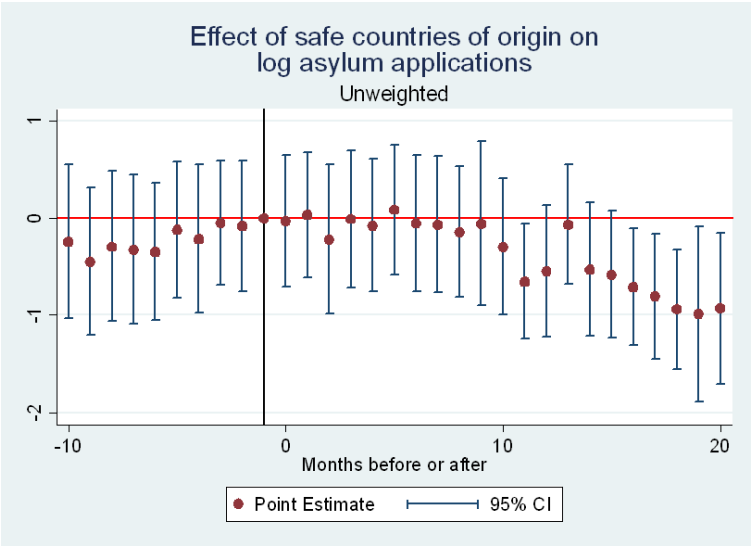
Table A.14: List of safe countries of origin and outcomes by repatriation risk. Unweighted version of Table 8

<i>Repatriation Risk</i>	<i>Dependent variable:</i>					
	$\ln(a_{jkt})$		Rec. Rate		Proc. Time	
	High (1)	Low (2)	High (3)	Low (4)	High (5)	Low (6)
List of Safe Countries of Origin	0.39*** (0.08)	-0.81*** (0.07)	0.01 (0.01)	-0.03*** (0.01)	-2.44*** (0.35)	0.51 (0.37)
Observations	11,615	10,290	11,615	10,290	11,615	10,290
Adjusted- $R^2$	0.83	0.89	0.81	0.79	0.76	0.72
Dyad FE	Yes	Yes	Yes	Yes	Yes	Yes
Origin-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Destination-time FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors clustered by origin-month in parentheses.

Source: Authors' elaboration on EUROSTAT (2020) and data on lists of safe countries of origin from Guichard (2020).

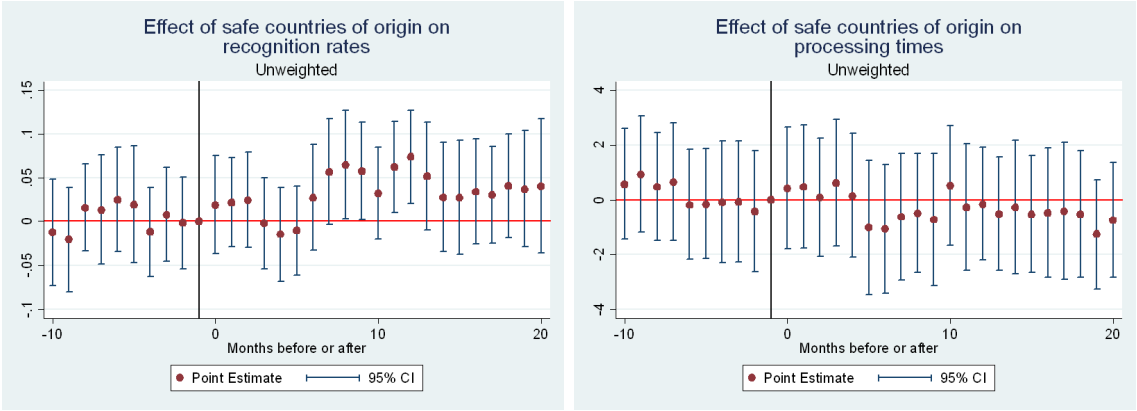
Figure A.1: Event Study Representation of the Effect of the List of Safe Countries of Origin on Log Asylum Applications. Unweighted version of Figure 4.



Notes: Estimates from Eq. (8) on the staggered sample, which drops the corridors between France and Albania, Bangladesh, Georgia, Mali, Turkey and Ukraine. The bars represent the 95 per cent confidence intervals around leads and lags. Standard errors clustered by origin-month.

Source: Authors' elaboration on EUROSTAT (2020) and on the data on the lists of safe countries of origin from Guichard (2020).

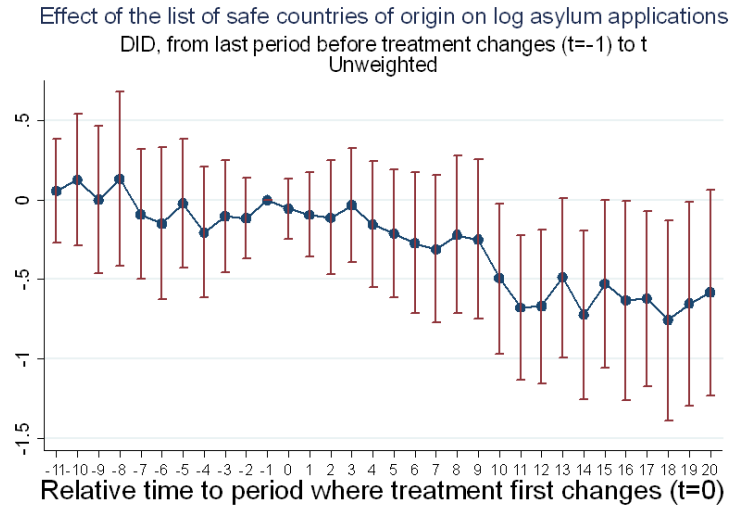
Figure A.2: Event Study Representation of the Effect of the List of Safe Countries of Origin on Recognition Rates and Processing Times. Unweighted version of Figure 5.



Notes: Estimates from Eq. (8) on the staggered sample, which drops the corridors between France and Albania, Bangladesh, Georgia, Mali, Turkey and Ukraine. The bars represent the 95 per cent confidence intervals around leads and lags. Standard errors clustered by origin-month.

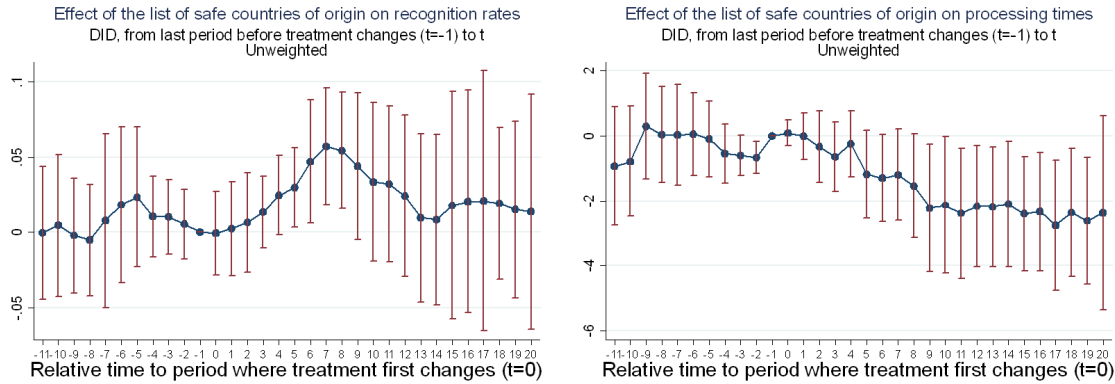
Source: Authors' elaboration on EUROSTAT (2020) and data on lists of safe countries of origin from Guichard (2020).

Figure A.3: Representation of the Effect of the List of Safe Countries of Origin on Log Asylum Applications with the Estimator of de Chaisemartin and D'Haultfoeuille (2021). Unweighted version of Figure 7.



Notes: Estimates from Stata command `did_multiplot` (see de Chaisemartin et al., 2019) on the full sample: 21,905 observations. The bars represent the 95 per cent confidence intervals around long difference effects and placebo tests. Standard errors clustered by origin-month based on 100 bootstrap replications.  
Source: Authors' elaboration on EUROSTAT (2020) and data on lists of safe countries of origin from Guichard (2020).

Figure A.4: Representation of the Effect of the List of Safe Countries of Origin on Recognition Rates and Processing Times with the Estimator of de Chaisemartin and D’Haultfoeuille (2021). Unweighted version of Figure 8.



Notes: Estimates from Stata command `did_multipligt` (see de Chaisemartin et al., 2019) on the full sample: 21,905 observations. The bars represent the 95 per cent confidence intervals around long difference effects and placebo tests. Standard errors clustered by origin-month based on 100 bootstrap replications.  
 Source: Authors’ elaboration on EUROSTAT (2020) and data on lists of safe countries of origin from Guichard (2020).

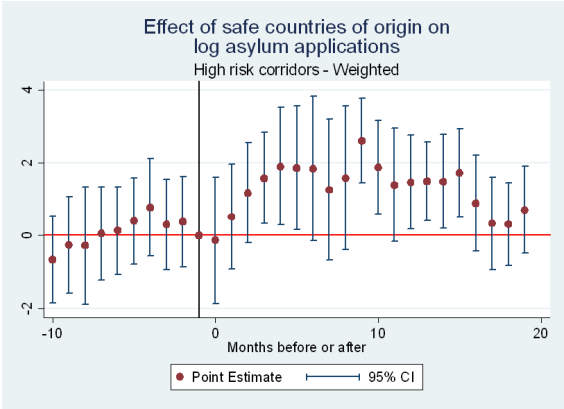


## A.5 Event study specifications by levels of repatriation risk

In principle, we can run event study specifications by levels of repatriation risk, as in Table 8. The problem with this approach would be that we would have corridors going in and out of the sample in different years. To be more consistent, we can focus on a subsample of non-switchers, that is origin-destination pairs that remain in the high risk or in the low risk sample during the full sample period. When we do that, we are left with too few observations in low risk corridors (182 corridor-month combinations). We keep a large enough number in high risk corridors: 5,288 observations. These account for 569,295 applications, which is just 17 per cent of the total number of first time applications in the staggered sample, but 38 per cent of observations in the high risk corridors. For this non-switchers, as for the high risk corridors in general (see Column (1) in Table 7), we observe, particularly in the weighted specification, a counter-intuitive increase in the number of first time applicants from an origin that enters into the safe countries of origin list. Figure A.5 shows that the positive effect of applications for this subsample corresponds to months between the fourth and the fifteenth after the policy.

We also ran the same specification on the same subsample using recognition rates and processing times as dependent variables, but none of these estimates showed any patterns that confirmed the significant results in Table 8. These results are available from the authors upon request.

Figure A.5: Event Study Representation of the Effect of the List of Safe Countries of Origin on Log Asylum Applications in a Subsample of Non-Switchers in High Repatriation Risk Corridors



Notes: Estimates from Eq. (8) on the staggered sample, which drops the corridors between France and Albania, Bangladesh, Georgia, Mali, Turkey and Ukraine, and based on a sample restricted to observations corresponding to a high repatriation risk; high repatriation risk defined as repatriation risk above the weighted median in the previous year. The bars represent the 95 per cent confidence intervals around leads and lags. Standard errors clustered by origin-month. Weights given by the total number of asylum applications  $a_{jt}$  into Europe in a given month from the origin  $j$ .

Source: Authors' elaboration on EUROSTAT (2020) and data on lists of safe countries of origin from Guichard (2020).