Reduction or deflection? The effect of asylum policy on interconnected asylum flows

Jan-Paul Brekke[†], Marianne Røed[†] and Pål Schøne*[,†]

[†]Institute for Social Research, PB 3233 Elisenberg, N-0208 Oslo, Norway
*Corresponding author. Email: psc@samfunnsforskning.no

Abstract

In 2015 Europe experienced an almost unprecedented number of asylum arrivals. The result was a revitalization of both the political and academic debates on the relationship between asylum policies and arrivals. In this article we study the core of this debate, namely the effects of asylum policy on asylum flows. We examine what recent European history of asylum regimes and arrivals tells us. The policy changes are examined both with regard to their direct effect on the flows to the country that made the changes, and with regard to their impact on the inflows to other countries. Finally, we analyze the policy effect on the total outflow from the sending countries. The findings clearly suggest that both a direct effect and a deflection effect are at work. The results also indicate that stricter asylum policies in the destination clusters reduce the total outflow of asylum seekers.

Keywords: international migration, asylum policies, asylum flows

1. Introduction

In 2015 Europe experienced an almost unprecedented number of asylum arrivals, leading to greater pressure on the coordinated policies of the Dublin and Schengen agreements. The result was a revitalization of both the political and academic debates on the relationship between asylum policies and arrivals. In this article we study the core of this debate, namely the effects of asylum policy on asylum flows.

The last several decades have seen a trend toward more restrictive asylum policies through, among other things, tougher measures limiting access to the border, tightening up the criteria for granting refugee status, and offering less favorable welfare conditions to the asylum applicants. Since the late 1990s the trend has also moved toward more coordinated asylum policies in European countries; for example, through the ambition to build a Common European Asylum System (CEAS). Still, policies are far from fully harmonized, leaving lots of scope for country-specific rules and regulations (Hatton 2015).

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A tougher asylum policy in one receiving country will probably deflect asylum seekers to other destinations. Awareness of this relationship is a main cause of tension between the European countries when it comes to asylum policy design. However, there is little empirical knowledge on the workings and strength of such a mechanism. This paper studies the effects of asylum policy on asylum flows. The main questions analyzed are if, and to what degree, a tightening of asylum policy in one country only redirects asylum flows to other destinations, or if the flows out of the countries of origin are reduced as well.

More specifically, we investigate the impacts of changes in the asylum policies of nine receiving countries located in the northern part of Western Europe (NWE), from 1985 to 2010. The selected countries are Austria, Belgium, The Netherlands, Switzerland, Germany, Denmark, Sweden, Norway, and the UK. Two dependent variables are analyzed: First are the bilateral (dyadic), yearly flows of asylum applicants from specific sending countries to one of the NWE receiving countries.[1] Second is the yearly total outflow of asylum seekers from each country of origin to all OECD receiving countries.

The policy changes in the NWE countries are examined both with regard to their *direct effect* on the dyadic flows of asylum seekers to the country undertaking policy changes and with regard to their impacts on the dyadic inflows to the other countries in the NWE group, which we refer to as the *deflection effect*. Finally, the policy changes in the NWE countries are examined with regard to *the effect on total outflow* from the origin countries to all receiving OECD countries.

Our empirical approach explores the fact that asylum seekers from specific source countries tend to apply for asylum in a quite limited number of major destination countries. These patterns have been linked to historical ties, colonial past, cultural links, common languages, shared religion, geographical proximity, and common borders (Hatton 2009). We use the term *destination cluster* to refer to the group of receiving countries which 'historically' has been selected by asylum seekers from a given origin. We deduce the deflection effect from the relationship between policy change in these destination cluster countries, and the inflow of asylum seekers from historically associated countries to receiving countries other than those undergoing policy changes. Correspondingly, we deduce the policy effect on total outflow from the relationship between the aggregated flow of asylum seekers out of an origin country and policy changes in the *destination cluster* countries for this particular origin.

We established a database with detailed records of asylum policy changes from 1980 to 2010 for the nine NWE countries. This database builds on earlier overviews of immigration policy changes, collected by researchers with similar analytical purposes (Hatton 2009; Mayda 2010; Ortega and Peri 2013). In addition, we have collected information by reviewing numerous articles and other written sources, as well consulting with experts in the receiving countries.

Our theoretical approach sees asylum seekers as a particular class of utility optimizing international migrants, where asylum seekers make the decision about if and, eventually, where to seek asylum by comparing costs and benefits of seemingly available options. On this basis, and subject to limited information, they choose the alternative which gives the highest expected utility.[2] The presence of earlier immigrants from the same origin may be the vital factor that places a receiving country within the destination cluster of applicants from a particular sending region. That is, such an established network may lower the costs related to gathering information about, as well as settling in, locations very distant from home both geographically and culturally. Hence, within this theoretical framework a more restrictive asylum policy is understood as raising the costs of applying for protection in the receiving country that undergoes the policy change.

The quantitative research literature on determinants of international migration flows has expanded in recent years, coinciding with a shift from studies without a micro-founded approach (e.g. Pedersen, Pytlikova and Smith 2008; Mayda 2010) toward studies that are consistent with random utility models (RUMs) on the individual level (Beine, Docquier and Özden 2011; Grogger and Hansen 2011; Bertoli and Fernández-Huerta Moraga 2013; Ortega and Peri 2013). Still, these latter studies also share an econometric shortcoming by analyzing bilateral migration flows using characteristics of origin and receiving countries only. In this paper we relate to Bertoli and Fernández-Huerta Moraga (2013) and their term 'multilateral resistance to migration' (MRM). MRM refers to the fact that bilateral migration rates do not depend solely on the relative attractiveness of the origin and destination countries belonging to a dyad, but also on to the opportunities in other destinations. We relate to this approach by including a weighted average of characteristics from the countries that constitute the origin-specific destination cluster in the empirical model that explains the dyadic migration rates.

Results from quantitative research suggest that policy restrictions have a negative direct effect on migration inflows (Beine, Docquier and Özden 2011; Hatton 2005; Mayda 2010; Ortega and Peri 2013). Some studies indicate a somewhat more complex dynamics between policy and flows. For instance, Czaika and de Haas (2016a) analyze how immigration and emigration flows are impacted by the introduction of travel visa requirements. They find that the negative effect on immigrant inflow from the affected origin countries is partly counterbalanced by a reduction in the corresponding outflow. Czaika and Hobolth (2016b) find that more restrictive asylum policy increases the inflows of irregular immigrants. Results from literature on asylum flows show that more restrictive policy does reduce asylum inflows. The estimated size of the effect, however, varies considerably between studies (see e.g. Holzer, Schneider and Widmer 2000; Hatton 2004, 2009, 2011; Neumayer 2005; Thielemann 2006; Finotelli and Sciortino 2013; Keogh 2013; Toshkov 2014).

Our results clearly show that both a direct effect and a deflection effect are at work. The results also indicate that stricter asylum policies in the destination clusters reduce the total asylum seeker outflow. We add to the literature in several ways: First, we construct and use detailed indexes describing changes in the asylum policies of nine major receiving countries in NWE countries. We follow Hatton (2004, 2009) in dividing the asylum policy changes into three categories based on the kind of policy area affected: the access to apply, the processing of applications, and the applicants' welfare. Second, we present new evidence on the deflection phenomena, and third, we analyze the policy effect on the total level of asylum seekers. These two last issues are investigated by exploring the facts that asylum applicants tend to end up in a few major, origin-specific destination countries. By studying the correlation between policy changes in these origin-specific destination clusters, on the one side, and the inflow of asylum seekers to other receiving countries, as well as the total outflow from the origins in question, on the other side, we deduce the deflection effect and the policy effect on total outflow.

The paper proceeds as follows: In Section 2 we describe in detail the analytical and empirical approach: the micro foundation and the estimation strategy, the data and construction of variables, and the identification issues. In Section 3 we present the results, before concluding in Section 4.

2. The analytical approach

2.1 The micro foundation

The scale of migration (asylum) flows from a country of origin, o, can be expressed as:[3]

$$m_{\mathrm{oht}} = Pop_{ot}\ p_{oht}\ \eta_{oht},$$
$$m_{ot} = Pop_{ot} p_{ot} \eta_{ot},\ p_{ot} = \sum\nolimits_{r}^{n} p_{ort} = 1 - p_{oot}. \tag{1}$$

m_{oht} is the flow of migrants from sending country o to receiving country r, $r \in R = \{1, \ldots, n\}$, $o \in \mathrm{O} = \{1, \ldots, j\}$, $r \neq o$, in year t. m_{ot} is the total outflow of asylum seekers from o in the same year. We refer to pairs of origin and destination countries (o, r) as dyads. Pop_{ot} is the number of individuals, i, in country o who may potentially seek asylum in country r or stay home. p_{ort} and p_{ot} are averages over the corresponding probabilities that individual i living in country o will move to (settle in) country r (p_{iort}) or move at all (p_{iot}). η_{oht} and η_{ot} are spatially and serially uncorrelated error terms with $E(\eta_{ort}) = E(\eta_{ot}) = 1$. Thus, the relationship between individual behavior and the aggregated flows goes through the probability p_{ioht}.

In the economic literature the functional relationships between dyadic migration rates and their determinants in countries of origin and possible destinations are deduced from RUM at the micro level. Within this framework it is assumed that the individual picks the destination that maximizes his or her utility:

$$U_{ioht} = V_{oht} + \nu_{ioht}, \tag{2}$$

where $\mathrm{V}_{\mathrm{oht}}$ signifies the deterministic, and observable, part of the utility experienced by individuals from the population of country o if they settle in destination $h = r \in R$ or if they stay home $(h = o)$. Furthermore, ν_{ioht} is the stochastic residual picking up the unobservable individual components of the utility associated with each choice.

Within this framework dyadic migration rates may be satisfactorily explained by characteristics of the sending (o) and recipient (r) country if the multinomial logit applies to the behavior of individual decision-makers, i.e. ν_{ioht} is generated by the extreme value type 1 distribution.[4] By imposing strong restrictions on the preferences of individuals, this model disregards the deflection effect.

Employing the nested logit model as their micro foundation, Bertoli and Fernández-Huerta Moraga (2013, 2015) deduce a framework where migration rates may also be affected by the time-varying attractiveness of alternative destinations $(h \neq r)$. Then ν_{ioht} is generated by (variants of) an underlying generalized extreme value (GEV) function. Referring to the literature on trade flows (see e.g. Anderson and Van Wincoop 2003), Bertoli and Fernández-Huerta Moraga (2013) denote this 'attractiveness of alternative destinations' as the 'multilateral resistance to migration' (MRM). In our opinion this phenomenon is quite similar to the deflection effect we want to analyze here. Our empirical approach, described below, may be interpreted as a linear approximation to a model deduced from this kind of nested logit micro foundation.[5] The MRM (deflection) mechanism is captured by including weighted averages of pull factors in the origin-specific destination clusters in the empirical models explaining the asylum flows.

2.2 The equations to be estimated

The deterministic parts of the utilities in Equation (2) are now specified as:

$$V_{oht} = \beta X_{ht} + \rho Y_h + \tau C_{oh} + \lambda C_t, \tag{3}$$

where V_{oot} ($h = o$) includes time-variant origin attributes (X_{ot}) like political circumstances and economic conditions affecting the standard of living, as well as time-invariant factors like climate (Y_o). V_{oht} (all $h \neq o$) includes time-variant characteristics of the potential receiving countries (X_{ht}), particularly asylum policy tightness and variables affecting the standard of living. Y_h signifies time-invariant factors in the country of destination, while C_{oh} indicates constant factors, like shared language or dyad-specific policy measures which are unchanged in the period we study, that affect the costs or gains of applying for asylum in country h if coming from country o. Last, the utility of applying for asylum in all potential receiving countries may be simultaneously affected by time-varying factors common to all combinations of origins and destinations (C_t). One such factor could be changes in the asylum policies that are coordinated on a supranational level, e.g. through the EU, EEA, or the UN.

Combining Equations (1) and (3) with the approximations of Equations B2 and B3 (described in Appendix B), we establish the empirical relationships between our dependent variables, m_{ort} and m_{ot}, and a vector of observable independent variables (X) related to the political and economic development at the origin and destinations:

$$Ln(m_{ort}) = lnPop_{ot} + b_1 X_{rt-1} + b_2 X_{ot-1} + b_3 WX_{ort-1} + d_t + d_o + d_r + d_{or} + E_{ort}, \tag{4}$$

$$\mathrm{Ln}(m_{ot}) = lnPop_{ot} - a_1 X_{ot-1} + a_3 WX_{ot-1} + d_t + d_o + E_{ot}, \tag{5}$$

where Pop_{ot} now signifies the population in the country of origin. X_{rt-1} and X_{ot-1} are observations of one-year lagged, time-varying variables in receiving and origin countries, respectively. WX_{ort-1} and WX_{ot-1} are weighted sums of pull factors in the origin-specific destination cluster countries, which represent the linear approximations to the MRM terms in Equations B4 and B5 (Appendix B). The design of these variables will be elaborated in Section 2.4.

The d variables represent fixed effects specific to origin (d_o) and receiving countries (d_r), as well as years (d_t) and dyads (d_{or}). In some of the model specifications of Equation (4) we replace the observable X_{ot-1} variables by an origin-time fixed effect (d_{ot}). Finally, the error terms, E_{ort} and E_{ot}, account for the measurement errors and omitted variables.

With regard to estimation strategy, our approach is to estimate different specifications of Equations (4) and (5) by OLS, Tobit, or Poisson pseudo-maximum likelihood (PPML) procedures. Using OLS on the log of the dependent variable is the main strategy chosen in most earlier studies that analyze the determinants of dyadic migration flows in general (see e.g. Pedersen, Pytlikova and Smith 2008; Ortega and Peri 2009, 2013; Mayda 2010; Grogger and Hanson 2011), and dyadic asylum flows in particular (Hatton 2004, 2009, 2011; Neumayer 2004, 2005). Santos Silva and Tanreyro (2006) show that heteroscedasticity in the residuals of (1), η_{oht} and η_{ot}, will make the residuals of Equations (4) and (5) correlate with the regressors. Beine, Bertoli and Fernandez-Huertas Moraga (2015) point out that this calls for estimating Equations (4) and (5) in levels (instead of logs) by PPML. However, with regard to the dyadic flows, they emphasize that this choice requires always including origin-time dummy variables among the regressors in order to control for the MRM terms and the number of potential migrants. It follows from Equation B3 in Appendix B that the same applies to the total outflow from the source countries. Beine, Bertoli and Fernandez-Huertas Moraga (2015) also point out that the case for relying on PPML is strengthened when the dependent variables take zero values. Referring to Santos Silva and Tenreyro (2011), they emphasize that the PPML estimator performs well even with a large share of zeros in the data. Still, with the presence of many zero values in the dependent variable, LeSage and Fischer (2010) recommend estimating the log of migration flows with a Tobit procedure.

Following these guidelines and practices, we use the PPML procedure (on levels) only when origin-time dummies are included as controls. When the dependent variables take zero values, but the origin-time dummies are excluded, we use Tobit on logs. We use the log-linear approach using OLS when missing values are omitted. This approach incorporates the trade-off we are faced with: We want to estimate a broad set of models incorporating different sets of controls, and we are to some extent unsure whether missing flows are indeed zeros or missing for other reasons.[6]

2.3 The relationship between dyadic flows and total outflows

By definition, the level of a dyadic flow, m_{ort}, is the product of two elements: $m_{ort} = \alpha_{or} m_{ot}$, where α_{or} *is the share of the total outflow* of asylum seekers from origin country *o* going to destination country *r*. Thus, the change in the dyadic flow following a change in one of the independent variables (measured by *V*), included in Equation (4), may in general be expressed as:

$$\frac{dm_{ort}}{dV} = \frac{da_{or}}{dV} m_{ot} + a_{or} \frac{dm_{ot}}{dV}. \tag{6}$$

The first element of the aggregate on the right-hand side is the change in the share given the total outflow from origin country *o*, while the second element is change in the total outflow given the share ending up in *r*. Suppose first that $dV > 0$ represents a tightening of the asylum policy, or a deterioration of living conditions, in the receiving country. In that case we expect both the first and second terms in Equation (6) to be negative or zero. The absolute value of the aggregated change, $\frac{dm_{ort}}{dV}$, should accordingly be greater than (or equal to) the partial change in the share, $\frac{da_{or}}{dV} m_{ot}$.

Suppose instead that $dV > 0$ represents an average tightening of the asylum policy, or a deterioration of living conditions, in the (other) receiving countries that belong to the destination cluster of asylum seekers from country *o*. In this case we expect the first term of Equation (6) to be positive or zero and the second to be either negative or zero. It follows that

$$\frac{dm_{ort}}{dV} \leq \frac{da_{or}}{dV} m_{ot}.$$

Thus, a more restrictive asylum policy in one destination country may have two opposite effects on the inflow to other receiving countries. The first is a positive one, since the share of total asylum flows moving in the direction of alternative destinations will probably increase, while the second is a negative one if the total outflow from the origin is affected.

When we estimate Equation (4), including the fixed effects (d_t, d_o, and d_{or}), the coefficient will reflect the aggregated change, $\frac{dm_{ort}}{dV_{ot}}$. In the specification where we replace the observed X_{ot} variables by origin-time fixed effects (d_{ot}) the estimated coefficients reflect the partial change in the share going to destination country *r*, given the total outflow from sending country *o*.

2.4 Data and variables

2.4.1 Asylum flows. The dependent variables are of two strongly related kinds: dyadic flows of asylum applications from sending to receiving countries, and aggregated total outflows from sending countries. The term receiving country signifies the country in which an asylum application is submitted. Sending or origin country refers to the applicant's nationality (citizenship).

What we actually observe is the yearly numbers of first-instance asylum claims by origin and destination country. Such claims are nearly always submitted at the border or within the receiving country by applicants who have travelled from their origin country without help from the UN refugee bodies or from other internationally recognized organizations.[7] Because a high share of the first-instance applications are turned down, they say very little about how many refugees are accepted into the receiving countries.[8] Since the early 1980s this data has been collected by the UNHCR from the governments in the receiving countries.[9]

Due to our ambition to carefully and thoroughly examine asylum policy changes, we had to limit the number of receiving countries that are included in the analysis. The nine selected countries are located in a geographic area in NWE. Moreover, all selected countries have a high standard of living and a welfare system that is generous and well-functioning when compared to the rest of Europe, as well as to the rest of the world.

To avoid time series with small numbers that are broken by many missing values, we chose to include only the sending countries that have contributed to at least 1 per cent of the total number of applications from 1985 to 2010 in at least one of the nine receiving countries. Altogether, this rule leaves us with 45 sending countries.[10]

The examined period contains a considerable share of the bilateral yearly flows with omitted (missing) values (29 per cent) and a lower share of the total outflows (8 per cent). An omitted value may occur for various reasons: a lack of asylum seekers to register, or perhaps the receiving country only registers relatively significant flows or has not yet reported these numbers to the UNHCR. So, should we consider omitted values as missing or as zero? We decided to approach this question in a pragmatic way. When analyzing the dyadic flows, we exclude the omitted registrations in the main analysis, but when analyzing total outflows we do the opposite by including them as zeros. In the case of dyadic flows, it seems probable that many of the omitted observations may be the result of inadequate reporting from individual receiving countries. In terms of total outflows, it is more likely that a missing value actually means that few or no asylum seekers are coming from a particular source country, because an error here would mean that all destination countries simultaneously fail to report. However, whatever we do, this is a potential source of measurement error in the dependent variables.

Figure A1 in Appendix A illustrates the development in asylum flows, in total numbers as well as to Western Europe and the NWE countries, during the last three decades. Western Europe has received a huge share of the total flow of asylum seekers, and the NWE countries have clearly been the dominant destinations within this region. Figure A2 presents the yearly inflows to the individual NWE countries.

2.4.2 Asylum policy reforms. Changes in asylum policy tightness are assessed via three sub-indexes that are meant to capture reforms (changes in laws, rules, and practices) affecting the three main areas that together make up the receiving countries' asylum policies. In this we follow the guidelines from Hatton (2004, 2009, 2011),[11] yielding the following sub-indexes:

- **The asylum policy index access (APIA)** captures changes in conditions related to access to the host country's territory. This concerns, among other things, the establishment of reporting systems between host countries, severity of penalties for trafficking, and sanctions against companies that transport asylum seekers across borders without the proper documents.
- **The asylum policy index process (APIP)** captures changes in conditions related to the process of determining the asylum seekers' status. This concerns reforms that widen or constrict the definition of refugee or the conditions for residence on humanitarian grounds. Examples include measures that reduce the possibilities for appealing a negative decision and wider openings for the detention and surveillance of rejected applicants.
- **The asylum policy index welfare (APIW)** captures changes in conditions related to asylum seekers' well-being while waiting for their applications to be determined and afterwards. This pertains to reforms related to the asylum seekers' access to benefits and employment, as well as their access to family reunification if granted residence.
- **The asylum policy index (API)** aggregates the changes in the preceding three indexes.

More or less tightness refers to how a policy change (reform) affects the asylum seekers' situation. If their situation becomes significantly less favorable, the index in question increases by one in the year the reform is implemented. In the opposite case, it decreases by one. If no significant changes take place within the relevant policy area, the index remains unchanged during the year in question. Through this method the reforms are modeled as leading to lasting changes in the asylum policy. That is, if a new law, rule, or practice has been implemented during one year, it will continue to work in the following years until new reforms are conducted.

The assessments of policy changes are based on a variety of sources and consultations with experts in the nine receiving NWE countries. In the end, however, we had to conduct subjective evaluations about the direction and significance of each reform.[12] Since the modes of policymaking vary considerably between countries, we have not been able to create a measure for comparing the level of strictness in the asylum policy between countries. Nonetheless, we think these indexes may work to indicate significant changes in asylum policy tightness within a country. Figure A3 in Appendix A illustrates the development in the aggregated API separately for each NWE country. The trend is clearly in the direction of more restrictive policy regimes.

2.4.3 Pull factors in receiving countries. The empirical models include two kinds of pull factors. The first is time-varying characteristics of the receiving countries (X_{rt-1}), which are the aggregated asylum policy index (API_{rt-1}) or the sub-indexes measuring changes in the different aspects of the asylum policy ($APIA_{rt-1}$, $APIP_{rt-1}$, and $APIW_{rt-1}$). To capture variation in asylum policy enforcement, a variable that measures right wing parties (RW_{rt-1}) in per cent of total cabinet posts in the destination country is added.[13] As an indicator of economic development in the receiving countries, we include their per capita gross domestic products in thousand (2000) dollars (GDP_{rt-1}).[14]

The second kind of pull factor is the weighted sums (WX_{ort-1} and WX_{ot-1}) of the same characteristics in the origin-specific destination cluster countries, which approximate the MRM and AP terms in Equations B2 and B3 (Appendix B). To construct these variables, we first assume that all nine receiving NWE countries belong to the same destination nest (D) for potential asylum seekers in all origin countries (o). This may be justified by the fact that compared to most other countries in the world, including those within the OECD, these countries are quite similar in many significant features: geographical location, political system, welfare organization, and standard of living. Even though the native populations have different mother tongues, they all are considered to be quite fluent in English as their second, if not first, language.

Observations of asylum flows reveal that, given the country of origin, asylum seekers submit their applications in a few main destinations countries. The best indicator regarding the probability that an application is submitted in country h in year t is probably the share of applications from the applicant's origin country submitted during the previous years. However, these origin-specific clusters of main destinations change slowly over time. To account for these particular asylum pattern features, we apply the following procedure to approximate the weights (γ_{ol}, γ_{oh} in B4 and B5 in Appendix B): Let $A_{olt(-4)}$ be the share of all asylum applications to NWE from country o, posted in country l, during the four preceding years ($t = -1$ to -4). If $A_{olt(-4)} > \alpha * \frac{1}{9} => I_{olt} = 1$, otherwise $I_{olt} = 0$, $0 \leq \alpha \leq 1$. If $I_{olt} = 1$, then country l is in the destination cluster of sending country o in year t. When nothing else is stated, then $\alpha = 1/2$—i.e. the threshold for inclusion in the cluster of main destinations is that country l has received more than half of the mean share of asylum seekers to the NWE group during the last four years.

We then assume that the following terms capture *the influence of pull factors in (other) receiving countries* on the dyadic asylum flow from country *o* to country *r*: $WX_{ort-1} = \sum_l \frac{pop_{lt}}{POP_t} I_{olt} X_{l(t-1)}$, l ∈ D, and l ≠ r. We further assume that the following terms capture the influence of pull factors in all (relevant) receiving countries on the total asylum outflow from country o: $WX_{ot-1} = \sum_h \frac{pop_{ht}}{POP_t} I_{oht} X_{h(t-1)}$ and h ∈ D,[15] where pop_{lt}, pop_{ht}, and POP_t signify the population size in the receiving country (l, h) and the aggregated population in all the nine NWE countries, respectively.

If $I_{okt} = 0$, then destination $k = h,l$ is, due to some unobserved characteristics, assumed to be an insignificant alternative in year *t*. Thus, changes in the observed pull factors have no influence on the flows between *o* and *r*, nor on the total outflow from *o*. In the opposite case, when $I_{okt} > 0$, the pull factors of the various alternative destinations are assumed to influence this flows according to their relative population size. In this manner, the distribution of asylum flows to the NWE countries in the recent past is used to indicate the origin-specific significance of receiving countries in the present. The relative population size of the receiving countries included in the destination cluster is then used to indicate the conditional probabilities of the significant alternatives.

In the following, WAPI_{ort-1} represents the weighted sum of the aggregated asylum policy index in the (other) destination cluster countries, while WAPIA_{ort-1}, WAPIP_{ort-1}, and WAPIW_{ort-1} represent these variables calculated on the basis of sub-indexes. WGDP_{ort-1} refers to the weighted sum of the lagged gross domestic product in the (other) cluster countries.

WAPI_{ot-1}, WAPIA_{ot-1}, WAPIP_{ot-1}, $\text{WAPIW}_{ot-1,}$ and WGDP_{ot-1} symbolize the corresponding weighted sums used in the empirical model of total outflows from the origin countries.

2.4.4 Push factors in the origin countries.

Economic development in the origin countries is indicated by their gross domestic products per capita, measured in thousand (2000) dollars (GDP_{ot-1}). To assess the quality of the political and humanitarian situation, two index variables are used: First is the *terror scale* (TS_{ot-1}), which varies between 1 (lowest terror) to 5 (highest terror). This index captures direct threats to safety: the degree to which the population is exposed to power abuse from the authorities (or by their lack of protection against such abuse) via imprisonment, torture, political murders, acts of war, and ethnic cleansing.[16] Second is the *civil liberties index* (CL_{ot-1}). CL_{ot-1} is graded between 1 (most free) and 7 (least free) and measures the prevalence of civil liberties and political rights in the origin country: rule of law, freedom of speech and belief, and organizational and associational rights.[17] These two indexes are chosen partly because they complement each other and partly because they are available as yearly time series from 1985 for nearly all origin countries in the analysis.

2.5 Identification issues

All independent time-varying *X* variables are included in Equations (4) and (5) with a one year lag. This is partly due to the fact that seeking asylum is a time-consuming activity. Thus, the crucial decisions taken in an asylum application's initial phase are probably influenced more by the values of the independent variables in the year before the application is registered in the receiving countries. The lags are also introduced to reduce simultaneity problems, particularly those linked to the mutually causal relationship between asylum policy tightness and the inflow of asylum seekers. As pointed out by Hatton (2004: 29), when analyzing the effect of asylum policy on asylum flows, it is important to recognize '. . . *that policy developments are linked to asylum flows as both cause and effect.*' The main mechanism is that policymakers tend to tighten asylum policy as a reaction to increased asylum pressure (Hatton 2004). However, the 'network effect' imposes a positive autocorrelation in the dyadic flows.[18] Hence, the estimated effect of tighter policy in the preceding year ($t-1$) on the number of new applications (in year t) may be upward biased. To elaborate on this point, assume that the asylum inflow from country o in year t is negatively affected by the strictness of the asylum policy of country r in year $t-1$, and positively affected by the asylum inflow level from o to r in the years preceding $t-1$. The bias in the estimated policy effect will emerge if a higher number of asylum seekers in the years preceding $t-1$ also contributes to a tighter policy in year $t-1$. To investigate the severity of this problem, some of the estimated specifications of Equation (4) also include the average inflow of asylum seekers from the origin country to the receiving country during years $t-2$ to $t-4$. This is a strategy similar to the one chosen by Neumayer (2005). He argues that the immediate preceding value of the lagged dependent variable should be left out in order to mitigate correlation with the error term. Even so, this procedure imposes problems related to including lagged dependent variables. However, the estimation of Equation (4) without controlling for the preceding flows may result in an omitted variable problem. To investigate the severity of both these problems a bit further, we follow the approach of Mayda (2010) and include an estimation of Equation (4) using a dynamic generalized method of moments (GMM). This method requires that endogenous and pre-determined variables are instrumented with their own lags and, accordingly, lead to a considerable loss of efficiency in the estimation. Thus, as in Mayda (2010), we have chosen to include this specification only as a robustness check.

3. Empirical results

In this section we first present results from the analysis of dyadic asylum flows and then the results from the analysis of total flows of asylum seekers out of the origin countries. In both cases we focus on the effects of policy changes in the receiving countries.

3.1 Policy effects on dyadic flows

3.1.1 The overall asylum policy. Table 1 presents the results from the analysis of the relationship between changes in the aggregated policy index (API) and the dyadic asylum flows. Six different model specifications of equation (4) are estimated. These models differ with regard to the fixed effects that are included and whether or not the average inflows of asylum seekers from previous years ($t = -2$ to -4) are accounted for. All models include the independent variables that vary with time and between receiving countries, i.e. the

Table 1. Asylum policy and dyadic asylum flows, 1985–2010

Model	1 OLS	2 OLS	3 OLS	4 OLS	5 OLS	6 OLS	5 PPML	6 PPML
Earlier asylum inflow		0.649***		0.475***		0.384***		0.304***
from origin to destination		(0.015)		(0.021)		(0.021)		(0.024)
Receiving country variables:								
Right wing government	0.003***	0.001	0.002**	0.001	0.001	0.000	–0.001	–0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
API	–0.046***	–0.066***	–0.041***	–0.059***	–0.015	–0.036***	–0.015	–0.038**
	(0.016)	(0.010)	(0.015)	(0.011)	(0.014)	(0.011)	(0.020)	(0.017)
GDP	0.158***	0.087***	0.162***	0.109***	0.169***	0.127***	0.261***	0.196***
	(0.025)	(0.015)	(0.026)	(0.016)	(0.018)	(0.014)	(0.028)	(0.024)
Cluster country variables:								
WAPI	0.141***	0.125***	0.095**	0.115***	0.630***	0.422***	0.463***	0.372***
	(0.047)	(028)	(0.046)	(0.032)	(0.069)	(0.056)	(0.063)	(0.055)
WGDP	–0.076***	–0.041***	–0.028**	–0.027***	–0.265***	–0.133***	–0.204***	–196***
	(0.015)	(0.009)	(0.014)	(0.010)	(0.030)	(0.022)	(0.025)	(0.022)
Origin country variables:								
GDP	–0.284***	–0.058**	–0.260***	–0.106***				
	(0.041)	(0.024)	0.043	(0.027)				
Log population	–0.151	0.629**	0.438	0.719**				
	(0.616)	(0.311)	0.626	(0.385)				
Terror scale (TS)	0.234***	0.136***	0.228***	0.159***				

(continued)

Table 1. Continued

Model	1 OLS	2 OLS	3 OLS	4 OLS	5 OLS	6 OLS	5 PPML	6 PPML
	(0.036)	(0.027)	0.036	(0.026)				
Index civil liberties (CL)	0.325***	0.186***	0.317***	0.223***				
	(0.050)	(0.029)	(0.051)	(0.033)				
Fixed effects:								
Receiving countries (9)	X	X	X	X	X	X	X	X
Origin countries (45)	X	X	X	X	X	X	X	X
Years (26)	X	X	X	X	X	X	X	X
Receiving *x* origin countries			X	X	X	X	X	X
Origin countries *x* years					X	X	X	X
R^2	0.579	0.763	0.725	0.792	0.813	0.836	0.933	0.935
N	7486	7486	7486	7486	7486	7486	7486	7486

Standard errors are clustered within dyads. Level of significance: *≤ 10%, **≤ 5%, ***≤ 1%. All independent variables are included with one-year lag. Missing asylum flows are omitted, i.e. not included as zero values. Aggregated policy index (API). Dependent variable: log(dyadic asylum flows) and levels of dyadic asylum flows, OLS and PPML coefficients. Robust standard errors in parentheses.

policy variables (API, WAPI) and the indicators of economic standard of living (GDP, WGDP).

Models 1 to 4 also include variables that vary with time and between origin countries, namely the TS and CL indicators, the source country's GDP, and a log of population size.

Year fixed effects are included in Models 1 and 2. Thus, we control for common time shocks, i.e. underlying factors which in each year may simultaneously affect the flows of asylum seekers to, as well as the policy development in, all nine destination countries. Such factors may, among other things, be related to changes in international law conducted by the UN or EU. In these first two models, origin and receiving country fixed effects are also included, through which we control for underlying time-invariant factors in the source and destination countries. For example, a generally high level of social welfare spending could be a variable that affects both asylum policy strictness and the asylum seekers' attraction to a destination country. Good historic relations between the populations of the origin countries and their neighboring countries could affect both economic growth and the outflow of asylum seekers to western European destinations. The only difference between Models 1 and 2 is that we include the average inflows from previous years in the latter model.

The estimated coefficient API is negative and clearly significant in both Models 1 and 2, indicating that the direct effect of a more restrictive asylum policy on asylum flows is negative. The value of the API coefficient becomes more negative when controlling for inflow of asylum seekers from the same origin in the past years (− 2 to − 4). This supports our hypothesis that through a positive influence on both policy strictness and subsequent flows, earlier asylum flows (the asylum stock) impose a positive bias in this direct policy effect if not accounted for in the analysis. This implies that the long-run effect of policy is stronger than the short-run effect, which is plausible given that network effects on migration are at work.

The estimated coefficients of the WAPI variable are clearly positive and of approximately equal size in Models 1 and 2. This supports the hypothesis that a deflection effect is at work, which means that the flows of asylum seekers to one destination country increase with the tightening of policies in the close recipient substitutes.

The mean value of API is 4.35 (across *t* and *r*, see Table A1 in Appendix A). Thus, the estimated coefficient of API in model 2 suggests that, *ceteris paribus*, if the index increases by 10 per cent of its mean, the average dyadic inflows decrease with almost 3 per cent.[19] As the mean value of WAPI is 3.7, a 10 per cent increase in this variable (according to Model 2) increases the asylum inflow by more than 4 per cent.[20] To elaborate somewhat further on the interpretation of these results, in Sweden and Denmark the process toward a more restrictive asylum policy started around the late 1980s/early 1990s. From 1989 to 2010, the Swedish API index increased by 3 points, while the WAPI index increased by 6.3 points. The corresponding Danish development was 16 points up for the API and 6.4 points up for the WAPI during the same period. The results in model 2 therefore predict that the inflow of asylum seekers to Sweden should, *ceteris paribus*, decrease by around 19 per cent, due to the tightening of Sweden's policy, and increase by 84 per cent due to the tightening in other receiving countries. At the same time, the inflow to Denmark should decrease by approximately 102 per cent due to Denmark's policy tightening and increase by around 85 per cent due the corresponding developments in other destinations. Altogether, the policy changes should increase the inflow of asylum applicants by 65 per cent to Sweden and decrease it by

17 per cent to Denmark. Thus, the difference in the predicted inflows amounts to 82 percentage points.

Comparing the actual average of 1986–8 with the average of 2009–11, the Swedish inflow of asylum seekers increased by 64 per cent while the Danish inflow decreased by 55 per cent. Accordingly, the difference in the actual inflow to the two countries amounts to 119 percentage points. Therefore, results of Model 2 suggest that nearly 70 per cent (82/119) of this difference is due to the divergent development of Denmark's and Sweden's own API.

In both models the estimated coefficient of GDP per capita in the receiving country is positive, while the coefficient of the corresponding variable in the origin country is negative. This confirms the results of earlier studies suggesting that asylum flows, like migration in general, are affected by economic pull and push factors (Rotte, Voglar and Zimmermann 1997; Rotte and Vogler 2000; Hatton 2004, 2009, 2011; Neumayer 2004; Mayda 2010; Ortega and Peri 2013).

The coefficient of Model 2 suggests that the average inflow increases by 8 per cent and decreases by almost 6 per cent if the GDP per capita in the receiving and source countries, respectively, increases by 1000 dollars. However, when expressed as elasticities, these results translate into a substantially weaker negative effect from GDP at origin than the corresponding positive effect of GDP in the receiving country: A 1 per cent increase in the receiving countries' GDP—from their 2010 mean level (see Table A1)—increases the average asylum inflow by 3 per cent. A corresponding 1 per cent increase in the origin countries' GDP—from their 2010 mean level—decreases it by 0.2 per cent.

The coefficient of the weighted value of GDP per capita in the destination clusters (WGDP) is negative and significant. This finding is consistent with the sign of the WAPI coefficients, i.e. a positive development (from the point of view of the asylum immigrant) in both these pull factors within the close recipient substitutes reduces the inflow of asylum seekers to a country. Thus, this result suggests that the deflection effect also works through the economic pull factors.

The push factors at the origin countries, namely TS and CL, are both clearly significant and have the expected signs. The estimated effects of these push factors must also be considered as relatively strong. According to Model 2, an increase in the TS of one mean standard deviation raises the average dyadic flow by nearly 15 per cent,[21] while a corresponding increase in the CL index increases the average dyadic flow by approximately 27 per cent.[22]

In the next two models (Models 3 and 4) we add dyad-specific fixed effects. Again, the only difference between the two models is that we include the average inflows from previous years in the latter model. This procedure ensures that the results are not affected by unobserved time-invariant, origin–destination-specific features. One potential candidate in this respect is the aggregated stock of immigrants from the origin living in the destination when our analysis starts.

When comparing the R^2 in these two models with the former two, we can conclude that the dyadic fixed effects contribute considerably to the explanation of the total variation in the asylum flows. Still, comparing the pattern of the estimated policy coefficients also allows us to conclude that they are not affected very much by their inclusion. The estimated direct effect of a tighter asylum policy (the API coefficient) is almost exactly the same, while the deflection effect (the WAPI coefficient) appears slightly weaker and a bit less precisely estimated.

In Models 5 and 6, we add origin by year fixed effects. Thus, following the estimation strategy described in Section 2.2, these models are estimated by both OLS and PPML. Overall we conclude that the two procedures give quite similar results. One exception may be that the PPML coefficients indicate a stronger effect of GDP on the distribution of asylum seekers among receiving countries.

Including origin by year fixed effects absorbs all variation in observed and unobserved time-varying, origin-specific variables. This also includes the yearly total outflows of asylum seekers from the source countries. Hence, according to the relationships explained in Section 2.3, while the coefficients of the first four models pick up *the aggregate change* in the dyadic asylum flows, these last two models only capture effects that emerge through *the distribution* of asylum seekers between receiving countries. More precisely, in the estimations of Models 1 to 4 the coefficients reflect both the first and the second element on the right-hand side of Equation (6). In the estimations of Models 5 and 6, only the first element of Equation (6) is captured by the coefficients. This may explain why the API coefficients are somewhat reduced from the first four to the last two models, i.e. since asylum policy tightening in the receiving country is expected, if anything, to have a negative effect on the inflow of asylum seekers, both through the share arriving and through change in total outflow. This may also explain why the absolute values of the WAPI and WGDP coefficients increase when including the year by origin fixed effects—that is, since worse (better) conditions in the other main receiving (cluster) countries are expected to, if anything, have a negative (positive) influence on the total outflow of asylum seekers. Thus, the much stronger positive effects of WAPI when estimated via Models 5 and 6, versus Models 1 to 4, suggest that asylum policy strictness in receiving countries has an influence on the total outflow from the origins. Comparing the corresponding set of coefficients related to WGDP indicates that the same is true with regard to economic development in the destination cluster countries.

3.1.2 The sub-dimensions of asylum policy.

Table 2 contains the results for the policy variables estimated in Models 4 and 6 from Table 1, where the three sub-indexes are included instead of the aggregate index. We present results from two variants of the models: one where all three sub-indexes are included simultaneously and one where each sub-index is included separately. Again, following our analytical strategy, Model 6 is estimated by PPML and by OLS.

With respect to the direct policy effects, the estimated coefficients of the APIP (processing of applications) and APIW (welfare of applicants) variables are always negative and in most cases significantly different from zero.

Irrespective of model specification and statistical procedure, the APIA (access to apply) coefficient turns out to be rather small and insignificant. This result may indicate that the access dimension has a weaker direct effect than the other two policy dimensions on the inflow of asylum seekers. However, we cannot rule out that endogeneity plays a role, i.e. that the simultaneous determination of policy and asylum flows induces an upward bias in the estimates of the direct effects. If politicians primarily resort to the access type of policy

Table 2. Asylum policy and dyadic asylum flows, 1985–2010

Model	4 OLS	4 OLS	4 OLS	4 OLS	6 OLS	6 PPML	6 PPML	6 PPML	6 PPML
Receiving country variables:									
APIA	0.018	–0.019			0.053	–0.081	–0.016		
	(0.039)	(0.038)			(0.036)	(0.061)	(0.064)		
APIP	–0.057***		–0.085***		–0.038**	0.036		–0.008	
	(0.021)		(0.019)		(0.020)	(032)		(0.031)	
APIW	–093***			–0.115***	–0.077***	–0.143***			–0.088***
	(0.023)			(0.020)	(0.024)	(0.037)			(0.033)
Cluster country variables:									
WAPIA	0.246	0.483***			0.615***	0.374	10.44***		
	(0.161)	(0.124)			(0.242)	(0.243)	(0.221)		
WAPIP	–0.023		0.218***		0.745***	0.674***		0.825***	
	(0.114)		(00.76)		(0.176)	(0.163)		(0.125)	
WAPIW	0.178**			0.215***	–0.016	–0.073			0.468***
	(0.092)			(0.064)	(0.138)	(0.154)			(0.119)
R^2	0.792	0.789	0.790	0.792	0.837	0.934	0.933	0.926	0.934
N			7486				7486		

Standard errors are clustered within dyads. Level of significance: *≤ 10%, **≤ 5%, ***≤ 1%. All independent variables are included with one-year lag. Missing asylum flows are omitted, i.e. not included as zero values. Sub-policy indexes (APIA, APIP, and APIW). Dependent variable: log(dyadic asylum flows) and levels of dyadic asylum flows, OLS and PPML coefficients. Robust standard errors in parentheses.

measures when their countries are exposed to sudden and strong increases in the asylum inflows, i.e. try to build ‘fences’ and close the border, such a bias may be particularly strong with regard to the APIA sub-index.[23]

When looking at the weighted indexes that reflect different dimensions of the asylum policy in other relevant destinations (WAPIA, WAPIP, WAPIW), we find that their coefficients are all positively estimated when included separately. In this case the PPML coefficients turn out considerably higher than the corresponding OLS estimates. The pattern becomes less clear when these variables are included simultaneously. The fact that all three coefficients increase strongly when they are entered separately suggests that multicollinearity is an issue, making it difficult to identify the separate influences of the weighted sub-indexes.[24]

3.2 Sensitivity analyses: The effect of policy on dyadic flows

In Table 3 we present the results from the sensitivity analyses performed on Models 4 and 6 in Table 1. In the first two columns, the coefficients are estimated while excluding Bosnia-Herzegovina and Serbia as origin countries. The purpose of this is to test whether the results are driven by the huge asylum flows out of these countries in the early 1990s. By comparing the results in Tables 1 and 3, we can clearly conclude that this is not the case.

The estimations in the next two columns are performed while excluding the by far largest recipient country during the entire period we study, Germany. This reduces the number of observations by nearly 1000. As can be seen, the coefficients of the WAPI and WGDP variables become smaller in value and less precise in Model 4. Compared to the coefficients of Table 1, we may conclude that the estimates of Model 6 are not significantly affected by the exclusion of Germany, but the results regarding the deflection effect in Model 4 become less conclusive.

The coefficients in the next four columns are obtained while including as zeros all observations with a missing value on asylum flows. Following our analytical strategy when faced with many zeros in the dependent variable, we estimate model 4 with Tobit in logs[25] and Model 6 with PPML in levels. To compare the performance of the procedures, we estimate Model 6 with Tobit as well. They return very similar results, with the exception of the GDP coefficient.

The coefficients indicating direct effects of API and GDP in the destination countries do not change considerably compared to the corresponding results in Table 1. The coefficients indicating the deflection effects (WAPI, WGDP) are also fairly consistent with the results in Table 1. One exemption in this regard is Model 4, where the WAPI and WGDP coefficients become close to zero when the missing values are included.

In the next four columns, the models are estimated separately for an early period (1985–98) and a late period (1999–2010). The results from both sub-periods clearly point in the same direction.

Finally, the last column contains the results of using Arellano and Bond’s GMM estimator to shed light on the endogeneity problem related to measuring earlier asylum flows. Models 4 and 6 turned out to be too demanding specifications for the GMM procedure, therefore Model 1 is used (described in Table 1). The lagged value of the dependent variable is included as an explanatory variable and is treated as an endogenous variable with two

Table 3. Asylum policy and dyadic asylum flows: sensitivity checks

Model	4 OLS	6 PPML	4 OLS	6 PPML	4 Tobit	6 Tobit	6 PPML	4 OLS	4 OLS	6 PPML	6 PPML	1 GMM
	Excluding Bosnia and Serbia		Excluding Germany			Including missing flows as zero		1985–1998	1999–2010	1985–1998	1999–2010	
Receiving country variables:												
API	–0.057***	–0.036**	–0.062***	–0.071***	–0.055***	–0.030**	–0.029*	–0.066*	–0.044*	–0.080	–0.052***	–0.044*
	(0.011)	(0.017)	(0.011)	(0.011)	(0.016)	(0.012)	(0.016)	(0.036)	(0.012)	(0.053)	(0.018)	(0.012)
GDP	0.109***	0.197***	0.079***	0.113***	0.095***	0.101***	0.192***	0.090***	0.047***	0.241***	0.221***	0.047***
	(0.017)	(0.024)	(0.018)	(0.022)	(0.018)	(0.014)	(0.023)	(0.032)	(0.011)	(0.042)	(0.050)	(0.011)
Cluster country variables:												
WAPI	0.113***	0.376***	0.0620*	0.304***	–0.002	0.391***	0.351***	0.097	0.134***	0.263**	0.247**	0.045*
	(0.032)	(0.056)	(0.035)	(0.071)	(0.037)	(0.060)	(0.053)	(0.079)	(0.040)	(0.111)	(0.106)	(0.024)
WGDP	–0.026***	–0.130***	–0.013	–0.134***	0.002	–0.119***	–0.123***	–0.042**	–0.034***	–0.162***	–0.091***	0.–012*
	(0.010)	(0.025)	(0.011)	(0.011)	(0.012)	(0.024)	(0.023)	(0.016)	(0.014)	(0.039)	(0.036)	(0.007)
R^2 adj/ Pseudo R^2	0.791	0.935	0.769	0.750	0.323	0.394	0.926	0.782	0.853	0.967	0.842	
N	7330	7330	6481	6481	9576	9576	9498	2981	4505	2983	4506	7305

The estimation procedure is OLS unless otherwise specified. Standard errors in parentheses are clustered within dyads. Level of significance: *≤ 10, **≤ 5, ***≤ 1. The models are described in Table 1. API. Dependent variable: log(dyadic asylum flows) (OLS, Tobit), levels of dyadic asylum flows (PPML). Coefficients and robust standard errors in parentheses.

lags. The direct policy index is treated as a predetermined variable. The coefficient of asylum flows shows clear inertia, with a value of 0.72 for the lagged variable (not presented). The results still suggest a negative and significant direct policy effect, even though the size of the effect is somewhat reduced compared to Model 1 in Table 1. The effect of the weighted policy index (WAPI) is still positive and significant but, as for the direct effect, the effect's size is somewhat reduced.

In Appendix C, Table C1, we present results from the estimation of Model 4 (in Table 1) with different thresholds for including receiving countries in the destination cluster of asylum seekers from particular origins (values of α, see Subsection 2.4). The results from these exercises substantiate the hypothesis of origin-specific receiving clusters, which is a central assumption in the analysis performed in this paper.

To summarize the sensitivity analysis, taken together we conclude that the different checks support the conclusions from the main analysis presented in Table 1.

3.3 Effects of policy on total outflows

Table 4 shows the results from analyzing the total asylum outflows from the origin countries, estimating variants of Equation (5). As explained in Section 2.4, this analysis includes the missing values as zero flows; therefore all models are estimated with the Tobit procedure.[26] In Model 1, the policy changes in potential receiving countries are measured by the weighted sum of the aggregated index in the destination clusters belonging to the different origin countries ($WAPI_{ot-1}$). In Model 2, the policy changes of the receiving countries are measured by the asylum policy sub-indexes: $WAPIA_{ot-1}$, $WAPIP_{ot-1}$, and $WAPIW_{ot-1}$.[27] In the last three columns, Model 1 is estimated for different subsets of origin countries.

With the exception of these differences, the models in Table 4 include the same set of explanatory variables. To control for origin-specific constant features, we include country fixed effects, and to control for common time shocks, we include year dummies. Thus, the effects we estimate are identified by variations within the origin countries over time.

By including the TS and CL indexes, we estimate the effect of such 'legitimized' refugee-generating push factors on the volume of asylum outflows. The estimated coefficients of these variables have the expected signs, but only the TS variable is significant. The values of the TS coefficients indicate that the factors summarized in this index explain a considerable part of the variation in the total asylum flows from the source countries. The mean value of the TS over all source countries and all years is 3.23 with a corresponding standard deviation equal to 1.08 (Table A1). Thus, the coefficients of the TS variables in Models 1 and 3 predict that a one standard deviation increase in the TS raises the outflow from the origins by approximately 40 per cent. These results, i.e. a strong impact of TS (reflecting direct threats to safety) and a relatively weak influence of CL (indicating the quality of civil liberties), are in accordance with the findings of Hatton (2009).

However, the economic push factors also seem to have an important impact. The estimated coefficient of the origin country's GDP per capita predicts that a US$1000 increase in GDP decreases the asylum outflow by almost 50 per cent. This impact seems to be strong, as the average GDP per capita in the source countries has increased by an average of approximately US$3500 from 1985 to 2010. In this regard, however, the variation between the origin countries is considerable. Expressed as elasticity, a 1 per cent increase from the

Table 4. Asylum policy and total asylum outflows

	Model 1	Model 2	Model 1 Excluding Bosnia, Serbia	Model 1 1985–1998	Model 1 1999–2010
Cluster country variables:					
Right wing	–0.003	–0.0107	–0.004	–0.033	–0.052
	(0.024)	(0.024)	(0.024)	(0.022)	(0.043)
WAPI	–0.835***				
	(0.231)				
WAPIA		–0.741	–0.857***	–0.628	–0.238*
		(10.032)	(0.234)	(0.380)	(0.132)
WAPIP		–10.781**			
		(0.750)			
WAPW		–0.180			
		(0.502)			
WGDP	0.206***	0.259***	0.222***	0.168*	0.97**
	(0.073)	(00.090)	(0.079)	(0.092)	(0.045)
Origin country variables:					
GDP	–0.492***	–0.524***	–0.497***	–0.038	–0.279***
	(0.177)	(00.180)	(0.178)	(0.033)	(0.192)
Log population	20.72	20.41	20.73	20.145	–10.23
	(20.60)	(20.54)	(20.62)	(30.27)	(20.92)
TS (1–5)	0.384**	0.409**	0.383**	0.488**	0.440*
	(0.177)	(0.173)	(0.179)	(0.171)	(0.226)
CL (1–7)	0.237	0.224	0.231	–0.004	0.186
	(0.200)	(0.200)	(0.202)	(0.197)	(0.124)
Pseudo R^2	00.228	00.233	00.227	00.330	00.351
N	1025	1025	1007	496	529

Fixed effects for year and origin country are included in all models. Standard errors in parentheses are clustered within origins. Level of significance: *≤ 10, **≤ 5, ***≤ 1%. Dependent variables: log total yearly asylum outflow to OECD. Tobit coefficients.

overall mean value (Table A1) of the source countries' GDP per capita decreases outflow by approximately 2 per cent.

Our measure of economic pull (i.e. the WGDP per capita in the destination cluster countries) also has the expected direction of impact on asylum outflows. The estimated coefficient of this variable predicts that a US$1000 increase in this variable increases the asylum outflow by around 20 per cent. Measured as elasticity, a 1 per cent increases in the overall average increases the outflow by approximately 6 per cent.

The WAPI coefficient in Model 1 is clearly negative, predicting that a one point increase in this policy index lowers the asylum outflow by approximately 54 per cent.[28] Since the average value of this variable increased by approximately seven points during the period we studied, this must be considered a very strong response—maybe a bit too strong to be directly used in policy guidance.[29]

In Model 2 all coefficients related to the three sub-policy indexes have the expected negative signs. The values of those related to access to apply (WAPIA) and the processing of applications (WAPIP) are of a considerable size. However, the WAPIP coefficient is clearly the largest and the only one that is significant.

In column 3 we present the results from estimating Model 1 while excluding Serbia and Bosnia from the sample of origin countries to examine whether these huge and sudden flows are driving the results. This is clearly not the case. In the last two columns, the model is estimated for two separate time periods: 1985–98 and 1999–2010. This exercise indicates that the relationships, deduced more precisely from the pooled regression, are present in both periods.

All in all, our results confirm the findings in earlier studies, i.e. that the outflow of asylum seekers is determined by a mixture of push factors related to traumatic and dangerous political conditions and push factors related to a low standard of living. In addition, our analysis indicates that the volume of asylum flows from the origin countries react quite strongly to changes in political and economic variables in the potential receiving countries.

4. Conclusion

With a main focus on asylum policy, we analyze the effects of push and pull factors on the direction and level of asylum flows. In line with earlier research, we find that the level of conflict and terror at the origin, as well as the economic development in both the sending and receiving countries, have a strong impact. The results also clearly indicate that a tightening of asylum policies in one receiving country reduces the number of new asylum seekers, both by deflecting the flow to other destinations and by reducing the registered outflow of applicants from the countries of origin. The deflection effect spurs tension and conflict between receiving countries and, at the same time, creates a strong urge for international coordination around asylum policy.

Finally, we would like to emphasize the following point: Asylum flows and forced migration flows are clearly overlapping but not identical phenomena. In this article we have based our analyses on UNHCR's numbers of registered asylum seekers. People may, of course, flee conflict or persecution without being registered as asylum seekers in OECD countries. Using tougher asylum policies to reduce registered asylum flows in the destination countries does not necessarily mean that refugee or forced migration flows are reduced accordingly. When the common causes of these flows are not removed, a decrease in registered asylum outflows to more affluent countries may result in a higher number of people living as refugees within their home country as internally displaced persons or in refugee camps across the border in neighboring countries. How asylum policies in destination countries affect refugee flows is an interesting topic for future research.

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Notes

1. Dyadic flows is a term often used in the economic literature on migration and refers to bilateral migration flows between specific sending/and receiving countries. In this paper we use bilateral and dyadic asylum flows as interchangeable terms.
2. The use of this utility approach does not mean that we do not consider asylum flows as forced migration. In the non-economic literature on both forced and voluntary migration, alternative models of individual action are discussed. These also point to the importance of information, networks, and family-based decision-making (De Haas 2010).
3. In this section we use asylum flows and migration flows as interchangeable concepts.
4. As pointed out in the introduction, some studies of dyadic migration flows (explicitly or implicitly) employ this empirical set up (see e.g. Pedersen, Pytlikova and Smith 2008; Mayda 2010).
5. This relationship is further elaborated in Appendix B.
6. The question of whether missing flows should be included as true zeros or omitted as missing values is discussed in Section 2.4.
7. Thus the yearly quotas of UNHCR refugees, accepted as in need of protection before they arrive at their destination, are not included in the numbers.
8. According to Hatton (2011), from 1982 to 2006 only 28 per cent of all asylum seekers to one of the OECD countries were recognized as being in need of protection, either according to the Geneva Convention (18 per cent) or for humanitarian reasons (10 per cent).
9. Published by the OECD: http://stats.oecd.org/Index.aspx?DataSetCode=MIG, and by UNHCR: http://popstats.unhcr.org/en/asylum_seekers.
10. Afghanistan, Albania, Algeria, Angola, Armenia, Azerbaijan, Bangladesh, Bulgaria, Burkina Faso, Bosnia and Herzegovina, Cameroon, Czech Republic, Chile, China, Congo, Croatia, Democratic Republic of Congo, Eritrea, Ethiopia, Georgia, Ghana,

Guinea, India, Indonesia, Iran, Iraq, Lebanon, Nigeria, Pakistan, Poland, Romania, Russia, Rwanda, Sierra Leone, Serbia, Slovak Republic, Somalia, Sri Lanka, Syria, Togo, Turkey, Viet Nam, Zimbabwe, Ukraine, Uganda.

11. We follow the guidelines of Hatton regarding the subdivision of the asylum policy into the three areas. However, the different types of policy reforms are not necessarily classified in exactly the same way as in the Hatton indexes. The method of constructing and gathering data, as well as each concrete policy change that we considered substantial enough to affect one of the indexes, are presented in the online appendix.
12. The principals that underlie the construction of the indexes and the different steps of the data gathering are described in detail in the online appendix. The same is true with regard to each concrete policy change in the different NWE countries that we have considered to be substantial enough to affect one of the indexes.
13. The source is Comparative Political Data Set 1960–2012: http://www.ipw.unibe.ch/content/team/klaus_armingeon/comparative_political_data_sets/index_ger.html.
14. The World Bank is the source of GDP data for both origin and destination countries.
15. The only difference between WX_{ort-1} and WX_{ot-1} is that the last term is calculated for all countries in the destination cluster, while the first is calculated for all except the receiving country when this is included in the destination cluster.
16. The source is US State Department. A description is available at: http://www.politicalterrorscale.org/about.php. Amnesty International produces a very similar index which is strongly correlated with the one we use but available for fewer country-years.
17. The source of this index is Freedom House. A description is available at: https://www.freedomhouse.org/report-types/freedom-world#.VKpS4J3KymQ/ http://qog.pol.gu.se/data/datadownloads/qogbasicdata.
18. The network effect on migration refers to the fact that the costs of migrating to a particular destination country are reduced by the stock of immigrants from the same ethnic group or source country who already live in the destination country (see e.g. Pedersen, Pytlikova and Smith 2008; Beine, Docquier and Özden 2011, 2015).
19. $((e^{-0.066} - 1)*100)*4.35*10 = -2.78$.
20. The interpretation of this is not that a 10 per cent (average) increase in the API of the other receiving countries increases the inflow of asylum applicants to the destination country in question by more than 4 per cent. This is because WAPI, by construction, has the following characteristics: First, the destination countries' asylum policy changes are weighted by their share of the total population in the NWE group. Second, only policy changes in destination countries that receive a relatively large share of the flow in question ($I_{olt} = 1$) may have a deflection effect on that particular flow.
21. The standard deviations of TS and CL across years and source countries are 1.08 and 1.54, respectively (see Table A1).
22. We have also estimated some of the models in Table 1 without WAPI and WGDP (results not shown). In general, the API is increased somewhat, for example in Model 1 from −0.046 to − 0.050. This might appear counterintuitive if a 'race to the bottom' mechanism creates a positive correlation between the receiving countries that are close substitutes for asylum seekers from the same origins (Hatton 2015). However, a strong positive correlation between API and WAPI turns clearly negative as soon as we control for year dummies. To identify the mechanisms driving this relationship, we would have

to investigate the interaction between policy developments in different countries—and particularly their time dynamics—more deeply, which is beyond the scope of this paper.

23. This line of argument may also suggest that the access measures have a more immediate, short-term effect, versus the other policy instruments, and to a greater extent work within the year they are implemented. To capture this immediate effect, one could argue that the current APIA value should be included in the empirical model, instead of the lagged one. We checked this by running a regression using current values of all three sub-indexes. The access variable is still not significant (results available upon request). Still, we would argue that this approach introduces stronger simultaneity bias in the estimation, and so we choose to keep the lagged version.
24. The correlations between the direct sub-policies are APIP-APIW 0.57, APIP-APIA 0.33, and APIW-APIA 0.47.
25. Missing flows are included as log(1).
26. As explained in Section 2.2, we do not use PPML since origin-time dummies cannot be included.
27. See Section 2.4 for a description of how these variables are constructed. In the following we omit the subscript.
28. The estimated coefficient is − 0.835. When adjusting the coefficient for the share of censored observations (8 per cent), the coefficient is equal to 0.77. This represents a reduction of approximately 54 per cent $((e^{-0.77}-1)*100)$.
29. We have estimated the model with OLS and PPML as well. The OLS WAPI coefficient is only marginally smaller than the one estimated with Tobit. The PPML estimate is, however, much smaller: −0.180 (107). When Model 1 is estimated with OLS, excluding observations with zero values (or missing) on the dependent variable, the WAPI estimate is not significant.
30. The exact same framework may be extended to involve k-nests.
31. In the case of the multinomial logit model v_{ioht} is iid according to the Extreme value type-1 distribution. The choice probabilities should be described by (B1), given $\tau=1$, and are characterized by the independence of irrelevant alternatives (IIA), i.e. the relative probability of choosing between two destinations is independent of the attractiveness of other available choices. The expression for p_{iost}, $s \in E$, is, of course, exactly parallel to (B2) for alternatives belonging to nest E.

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Appendix A

Table A.1. Mean values and standard deviations, 1985–2010

	Mean	Standard Deviation
Log (dyadic asylum flows)	4.60	2.07
Log (earlier dyadic asylum flows $t=-2$ to $t=-4$)/3	4.72	2.08
Percentage of right wing government in cabinet (RW)	31.11	32.36
API	4.35	4.00
APIA	1.77	1.50
APIP	1.58	1.88
APIW	0.99	1.44
WAPI	3.76	2.89
WAPIA	1.32	0.90
WAPIP	1.41	1.14
WAPIW	1.03	0.93
GDP per capita destination	31205	6116
WGDP per capita cluster countries	14765	8656
GDP per capita origin countries	3851	3985
Log (population origin countries)	9.83	1.47
Terror scale (TS, 1–5)	3.23	1.08
Civil liberties (CL, 1–7)	4.73	1.54

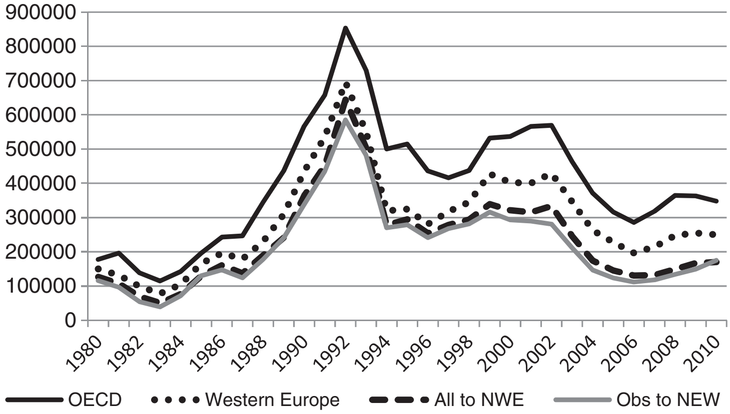

Figure A1. Yearly asylum flows to the OECD, Western Europe and the NEW countries, 1980-2010.

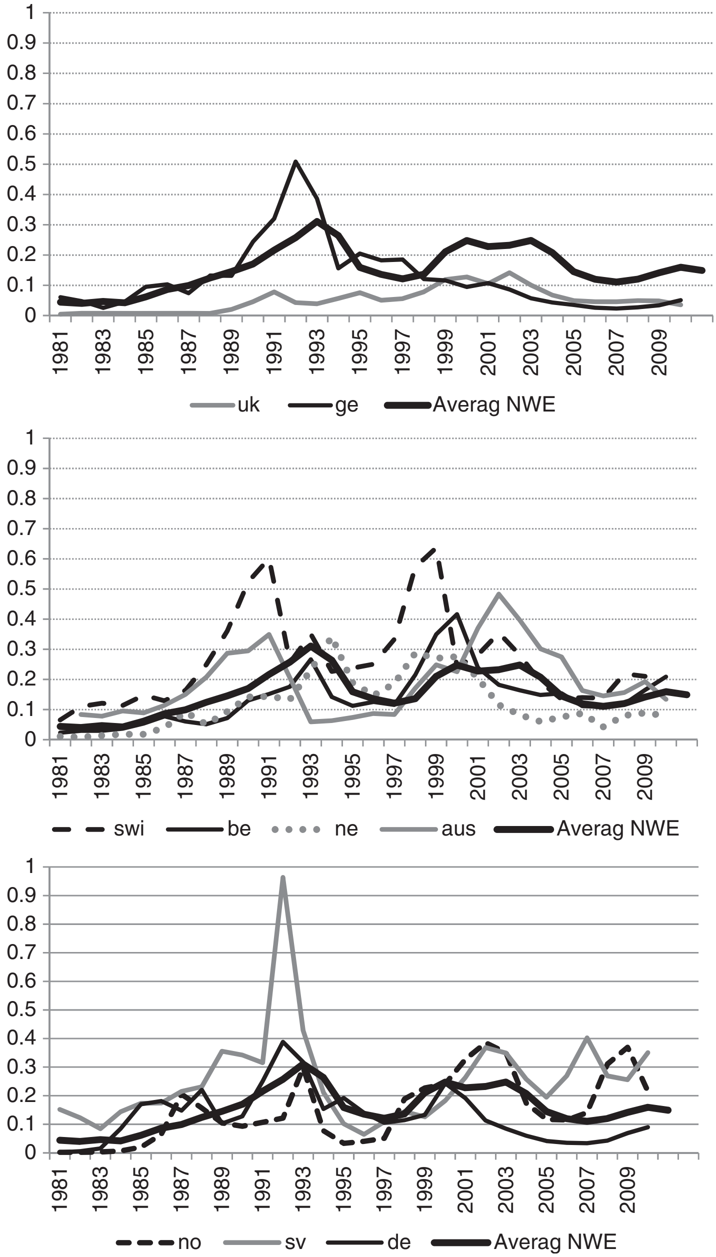

Figure A2. Asylum inflow/population size. Average and separate by country.

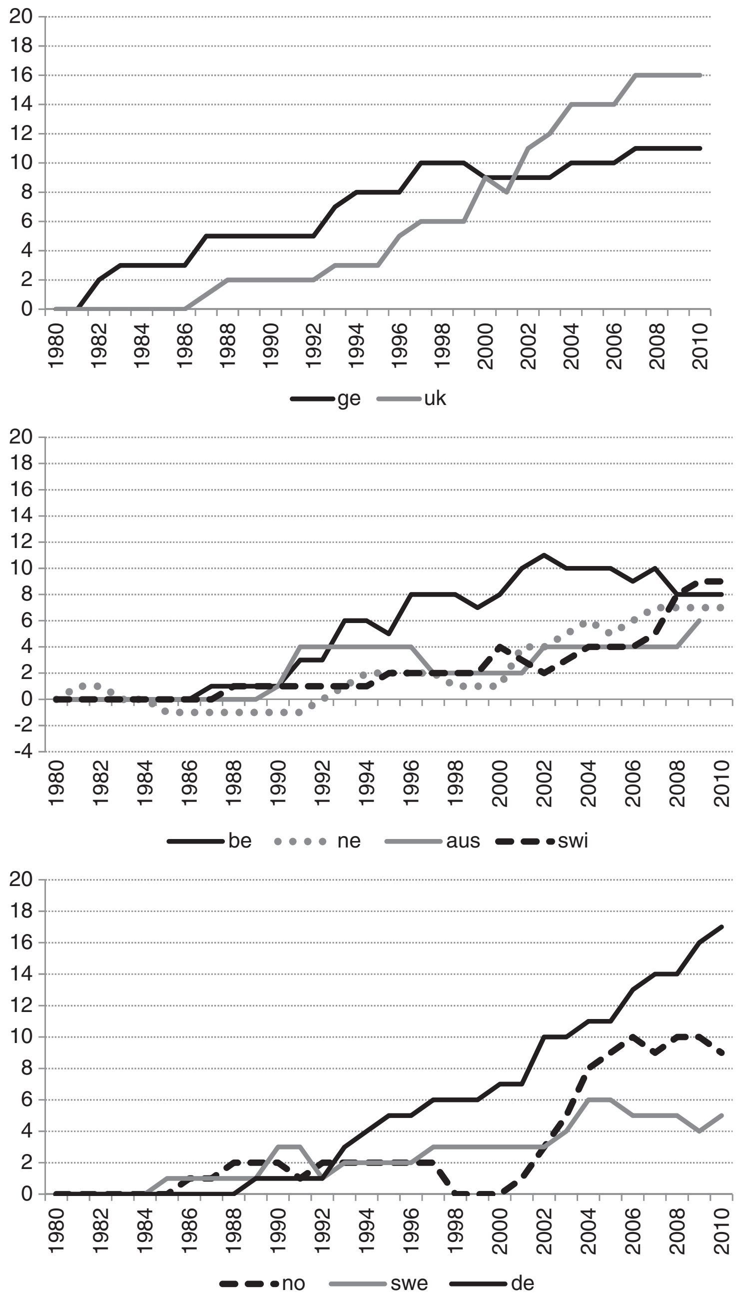

Figure A3. Asylum Policy Index (API).Changes over time in the NWE countries.

Appendix B: Elaborating on the micro foundation

Assume that the residual term v_{ioht}, defined in Equation (2), of Section 2.1, is generated by generalized extreme value (GEV) function and that corr(v_{iort}, v_{ioht}) = 1− τ^2 for all r, $h \in D$; zero otherwise, and corr(v_{iost}, v_{ioht}) = 1 − τ^2 ; zero otherwise, for all s, $h \in E$. Where D and E are nests which represent a non-overlapping partition of all alternative destinations ($R = D \cup E$) and h = o is a singleton; a nest with only one alternative.[30] The probability that individual i, from origin country o, apply for asylum in receiving country r is then:[31]

$$p_{iort} = \frac{1}{H}\left[e^{\frac{V_{ort}}{\tau}}\left(\sum\nolimits_{l\in D} e^{\frac{V_{olt}}{\tau}}\right)^{\tau-1}\right], p_{ioot} = \frac{1}{H}e^{V_{oot}}, p_{iot} = 1 - p_{ioot}$$
$$H = \left(\sum\nolimits_{l\in D} e^{\frac{V_{olt}}{\tau}}\right)^{\tau} + \left(\sum\nolimits_{k\in E} e^{\frac{V_{okt}}{\tau}}\right)^{\tau} + e^{V_{oot}} \qquad (B1)$$

The log of odds for moving to r compared to staying at home:

$$\ln\left(\frac{p_{iort}}{p_{ioot}}\right) = \frac{V_{ort}}{\tau} - V_{oot} + MRM_{oDt}, MRM_{oDt} = (\tau - 1)\ln\left(\sum\nolimits_{l\in D} e^{\frac{V_{olt}}{\tau}}\right) \qquad (B2)$$

The log of odds for moving at all compared to staying at home:

$$\ln\left(\frac{p_{iot}}{p_{ioot}}\right) = -V_{oot} + AP_{ot}, AP_{ot} = ln\left[\left(\sum\nolimits_{l\in D} e^{\frac{V_{olt}}{\tau}}\right)^{\tau} + \left(\sum\nolimits_{k\in E} e^{\frac{V_{okt}}{\tau}}\right)^{\tau}\right] \qquad (B3)$$

According to Bertoli and Fernández-Huerta Moraga (2013) the last term in Equation (B2) represents the multilateral resistance to migration. We claim that the last term in Equation (B3) represent the aggregated pull exerted on potential migrants living in o from all destination countries.

Let $\overline{V}_{oh}$ signify the average of V_{oht} over all t. Relaying on a first order Taylor expansions around $\overline{V}_{oh}$, the last terms of (B2) and (B3) may be approximated by:

$$\mathrm{MRM}_{oDt} \approx C_{oD} - \sum\nolimits_{l\in D} \gamma_{olD}(V_{olt} - \overline{V_{ol}}), \text{ and} \qquad (B4)$$

$$\mathrm{AP}_{ot} \approx C_o - \sum\nolimits_{h\in D\cup E} \gamma_{oh}(V_{oht} - \overline{V_{oh}}), \text{ respectively.} \qquad (B5)$$

where $\gamma_{olD} = \frac{\tau-1}{\tau}\overline{P}_{ol|D}$, and $\gamma_{oh} = \overline{P}_{oh|D\cup E}$. $\overline{P}_{ol|D}$ signifies the probability of choosing destination l, conditional on that the nest D has been selected, and given that $V_{olt} = \overline{V}_{ol}$, all $l \in D$, and $\overline{P}_{oh|D\cup E}$ denotes the corresponding average probability of choosing h conditional on that either D or E have been selected.

Appendix C: Investigating the hypothesis about origin-specific destination clusters

In the analysis presented in the main text, the criteria for the inclusion of a receiving country *k* in the destination cluster of asylum seekers from origin country *o* is the following: During the last four years ($t = -1$ to -4), country *k* received at least half ($\alpha = 1/2$) of the mean share of applicants to the nine NWE countries. When this is the case $I_{okt} = 1$, when this is not the case $I_{okt} = 0$ (see Section 2.3 for a more detailed description of the criteria and the construction of the cluster country variables). In Table C1, we show the results for the independent variables in focus when the threshold is raised ($\alpha = 1$) and when the threshold is lowered ($\alpha = 1/3$, $\alpha = 0$). As can be seen, the results are only marginally affected by the choice between the three higher limits. If all the nine countries, however, are included in the destination cluster ($\alpha = 0$), the estimated coefficients of WAPI and WGDP, keep the same signs, but are no longer significantly different from zero. To include all of the receiving counties in calculations of the weighted pull variables of the recipient alternatives is the strategy chosen by Hatton (2004) in his analysis of asylum migration to the EU countries 1981–99. As with our results, he finds a positive, but insignificant, effect of tighter asylum policy in the other EU countries.

In the last column of Table C1, the cluster variables are calculated for the receiving countries that are not in the destination cluster of the origin countries (i.e. $I_{okt} = 0$, given $\alpha = 1/2$). As expected, the values of the WAPI and WGDP coefficients then become close to zero and so insignificant.

Table C.1. Asylum policy and dyadic asylum flows—sensitivity checks

Receiving country variables	$\alpha = 1$	$\alpha = 1/2$	$\alpha = 1/3$	$\alpha = 0$	$I_{okt} = 0$[a]
API, aggregated	–0.057***	–0.059***	–0.054***	–0.039***	–0.061***
	(0.010)	(0.011)	(0.010)	(0.013)	(0.010)
GDP capita	0.110***	0.110***	0.110***	0.110***	0.110***
	(0.017)	(0.016)	(0.017)	(0.017)	(0.017)
Other cluster country variables					
WAPI, aggregated	0.077***	0.115***	0.098***	0.143	–0.034
	(0.030)	(0.032)	(0.033)	(0.100)	(0.035)
WGDP	–0.023***	–0.027***	–0.028***	–0.111	00.007
	(0.009)	(0.010)	(0.010)	(0.10)	(0.020)
Share of yearly flows to cluster countries	19	25	35	100	75

[a]and $\alpha = 1/2$.***≤ 1%. OLS coefficient from estimating Model 4 (Table 1) using different thresholds (α) for including receiving county, *k*, among cluster destinations of sending country, *o* ($I_{okt} = 1$)