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The EU's Social Connectedness to Ukraine and Its Implications for the Distribution of Ukrainian Refugees

After the Russian invasion of Ukraine on 24 February, more than 6.7 million people – mainly women and children – have fled the country (UNHCR 2022, as of 29 May 2022). This makes it the largest movement of displaced people in Europe since World War II, exceeding the numbers of the 2015/16 “migrant crisis” by a factor of three. The large and rapid influx of Ukrainian refugees thus poses another political and humanitarian challenge for Europe.

In order to prevent overloading of the EU's external borders and national asylum systems, the EU has activated the Temporary Protection Directive on 4 March 2022 for the first time. In contrast to refugees in 2015/16, Ukrainian citizens are thus entitled to visa-free travel within the EU and can apply for temporary protection in a country of their choice. This protection is initially valid for one year and includes access to social benefits, education, and the labor market (European Commission 2022a). Thus, there is no official allocation of refugees within the EU planned at this time. Instead, Ukraine's social connectedness with the EU is expected to play a crucial role for the refugees' choice of destination. In a survey of 1,900 Ukrainian refugees in Germany, the majority of respondents were accommodated privately, with 43 percent saying they were staying with friends or relatives. Additionally, the main reason given for choosing their destination was having friends or relatives living in that place (German

Federal Ministry of the Interior and Community 2022). More generally,

the fact that social networks at the intended destination influence migration decisions, since these connections help with finding accommodation and jobs or can provide financial support, is also documented in the empirical migration literature. For example, using a global sample, Bertoli and Ruysen (2018) found that existing social connections are an important factor in the choice between otherwise similar migration destinations. Furthermore, social networks of co-nationals are found to foster the refugees' economic integration by positively impacting their labor market outcomes (Damm 2009; Martén et al. 2019).

So far, most Ukrainian refugees have sought shelter in Ukraine's neighboring countries, with Poland taking in by far the largest number of refugees (3.6 million as of 29 May 2022, UNHCR 2022). However, it can be expected that some Ukrainians will move on to Western Europe (Brücker et al. 2022a). Given the prominent role of existing social connections, identifying the countries and regions that are most connected to Ukraine helps to determine where a disproportionate number of refugees may be expected. For this purpose, we rely on the Facebook Social Connectedness Index (SCI) by Bailey et al. (2018), as it constitutes a suitable measure for the social connectedness between regions based on Facebook friendship links.

THE SOCIAL CONNECTEDNESS INDEX AS AN INDICATOR FOR REGIONS TARGETED BY UKRAINIAN REFUGEES

The SCI, as first introduced by Bailey et al. (2018), measures the social connectedness between regions based on existing Facebook connections between individuals in these regions. According to Equation (1), the SCI of two locations i and j is given by the total number of Facebook connections between these locations, and the number of Facebook users in both locations (Bailey et al. 2018).

$$(1) \text{SCI}_{i,j} = \frac{\text{FB Connections}_{i,j}}{\text{FB Users}_i * \text{FB Users}_j}$$

Subsequently, the SCI is scaled in a way that it takes a minimum value of 1 and a maximum value of 1 billion. The resulting values give the relative probability of a Facebook friendship link between a given person in location i and a given person in location j . Facebook users are assigned to locations based on their information given, as well as their device and connection data (Bailey et al. 2018). The data used is based on a snapshot of Facebook connections from October 2021.

The SCI provides a unique measure of social connectedness. First, Facebook is widely used across countries and social groups. Second, Facebook friendship links can be considered a valid proxy for real-life friendships, as they must be accepted by both sides and are limited to 5,000 links per user (Bailey et al. 2018). The SCI has been shown to help explain various economic and social phenomena. For example, the probability of two countries trading with one another increases with their social connectedness as measured by the SCI. In fact, the SCI's explanatory power goes



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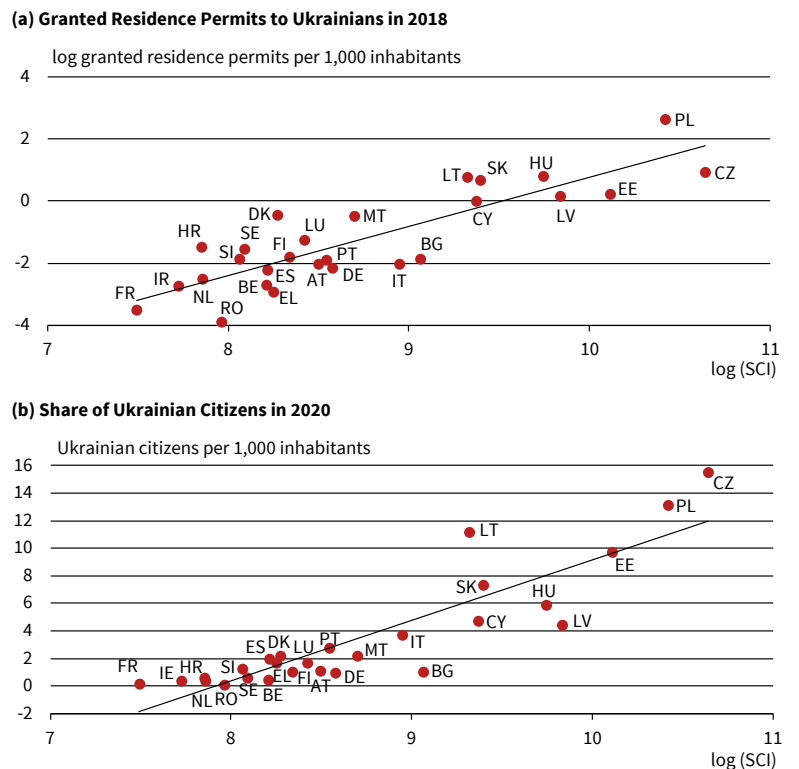
beyond the distance between countries (Bailey et al. 2021). Furthermore, the spread of Coronavirus in the US can be partly explained by the social connectedness of some regions with the early Corona hotspots (Kuchler et al. 2022). More related to our analysis, Bailey et al. (2018) show that the SCI helps in predicting migration movements within the US.

The fact that the SCI reflects the social connections that are relevant for migration decisions can be further shown by the relationship between the SCI and previous migration movements from Ukraine visualized in Figure 1: The upper panel (a) plots the natural logarithm of the SCI to Ukraine against the natural logarithm of first-time residence permits issued to Ukrainians in 2018 per 1000 inhabitants and shows that these variables are strongly correlated for EU countries ($\rho = 0.86$).¹ The lower panel (b) shows that the natural logarithm of the SCI is also highly correlated with the number of Ukrainian citizens holding a residence permit in 2020 per 1000 inhabitants ($\rho = 0.92$). Similarly, a high correlation between these measures is found at the county level (NUTS 3) within Germany ($\rho = 0.50$).² Thus, the SCI not only contains information on existing Ukrainian migrant networks at a national and sub-national level, but also goes beyond this by mapping international friendships that may be relevant to the refugees' choice of destination. Accordingly, the SCI is a valuable indicator of regions that are likely to be targeted more frequently by Ukrainian refugees.

The large heterogeneity as well as relative strengths of the social connectedness to Ukraine is depicted at the NUTS 3 level in Figure 2. For the EU and Germany, Figure 2 compares the distribution of the social connectedness to Ukraine with the social connectedness to (i) Jordan, which is assumed to be a proxy for the social connectedness to the 2015/16 refugees' countries of origin, mainly Syria,³ and (ii) Norway, which, as a Western European country that is not part of the EU but a member of the Schengen Agreement and strongly interconnected with the EU, is used as a benchmark. As can be expected, Germany and the EU as a whole have, on average, a stronger social connectedness to Norway than to Ukraine. However, there are many regions in which the social connectedness to Ukraine exceeds the connectedness to Norway. The social connectedness to Ukraine is also, on average, higher than to Jordan, reflecting the greater geographical and cultural proximity. For example, Berlin's social connectedness to the war-affected Ukrainian oblast of Sumy even exceeds the connectedness to a number of counties in the German state of Bavaria and is higher than to any region in Norway or Jordan.

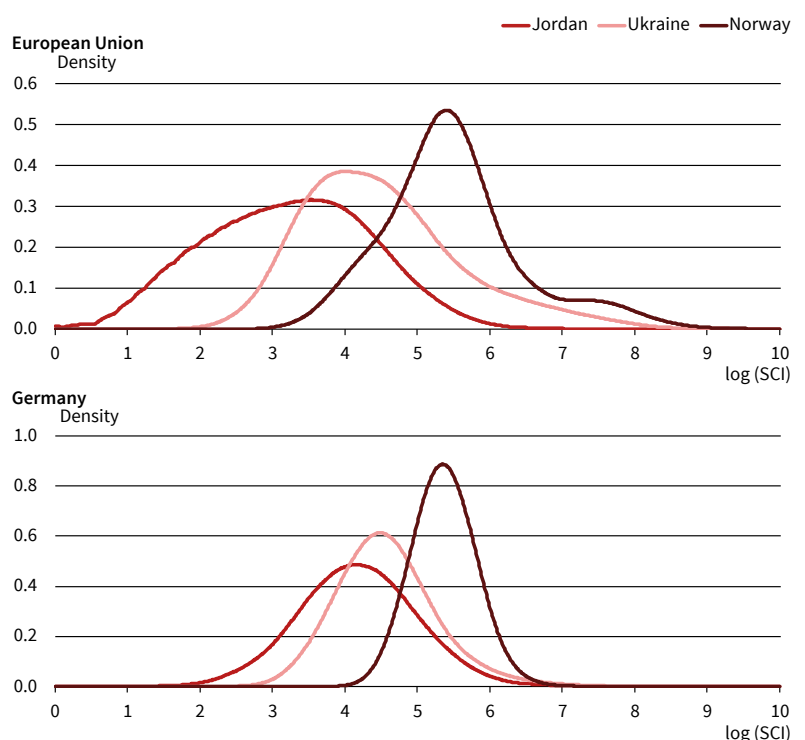
¹ It should be noted that the 2021 SCI data used also includes information on social connections to individuals who migrated to the respective countries in 2018.
² Own calculations based on data from the Federal Statistical Office Germany.
³ There is no SCI data available for Syria.

Figure 1
 The SCI and Measures for Previous Migration from Ukraine



The stronger social connection to Ukraine compared to Jordan, as a proxy for Syria, can partly explain the observed difference in people's attitude

Figure 2
 Comparison of the Social Connectedness to Ukraine, Jordan, and Norway



towards refugees now and in 2015/16,⁴ which also has implications for the refugees’ social integration and labor market outcomes as shown by Aksoy et al. (2021). Furthermore, it underlines the relevance of social connections in Europe for the choice of destination by Ukrainian refugees.

TARGETED COUNTRIES WITHIN THE EU

Figure 3 shows the social connectedness of European countries to Ukraine on a national level, as given by the SCI. The Czech Republic, Poland, and Estonia have the highest SCI values. The fewest connections are with Albania, France, and the UK. Generally, countries near Ukraine tend to have higher SCI values, but there are also several substantial deviations. For example, a given Ukrainian is twice as likely to have a Facebook connection to a given person in Italy than a Facebook connection to a given person in Romania.⁵

In the following, the SCI is used to determine the likelihood of refugees targeting EU countries based on their existing social connections. Within the EU, arriving refugees have the same legal status, so the choice among these countries should not be influenced by differences in immigration policies. Nevertheless, EU countries differ in terms of labor market conditions and social benefit schemes, which may constitute additional determinates for the refugees’ choice of destination besides their social connections. For example, Ortega and Peri (2013) show that a higher GDP per capita at destination positively affects migration

⁴ See, for example, Washington Post (2022), “European Countries Are Welcoming Ukrainian Refugees. It Was a Different Story in 2015”, <https://www.washingtonpost.com/politics/2022/03/23/ukraine-refugees-welcome-europe/>.

⁵ Italy has the largest Ukrainian community among the Western European countries and attracted large numbers of Ukrainian migrants in the past. See, for example, Financial Times (2022), “They Have Connections Here’: Ukraine Refugees Receive Warm Welcome in Italy”, <https://www.ft.com/content/3951c64b-1bcf-465f-8899-622eefea4448?list=intlhomepage>.

decisions, especially for migration within the EU. This also became evident in the survey among Ukrainian refugees in Germany: 17 percent of the respondents said that job prospects were the main reason for choosing their current location, which makes it the most popular reason after social connections and recommendations by friends and relatives (German Federal Ministry of the Interior and Community 2022). Therefore, our analysis based on the SCI can be interpreted as a counterfactual distribution of Ukrainian refugees within the EU, reflecting the scenario where social connections are the only determinant for their choice of destination. While our measure cannot perfectly predict the distribution of refugees, it does point out which countries are likely to be disproportionately affected by an inflow of refugees because of an above-average social connectedness to Ukraine.

First, we determine how much each country’s SCI deviates from the aggregated EU SCI, which is given by the population-weighted mean of the member countries’ SCIs to Ukraine. This SCI deviation is given by Equation (2). Second, a new weight that combines the population weight with the social connectedness to Ukraine is calculated for each country within the EU. According to Equation (3), this combined weight of country *i* is given by the population weight times the country’s SCI deviation. The resulting weights can be interpreted as the probability of an existing Facebook friendship link between a Ukrainian and a person in the EU being to a person in country *i*.

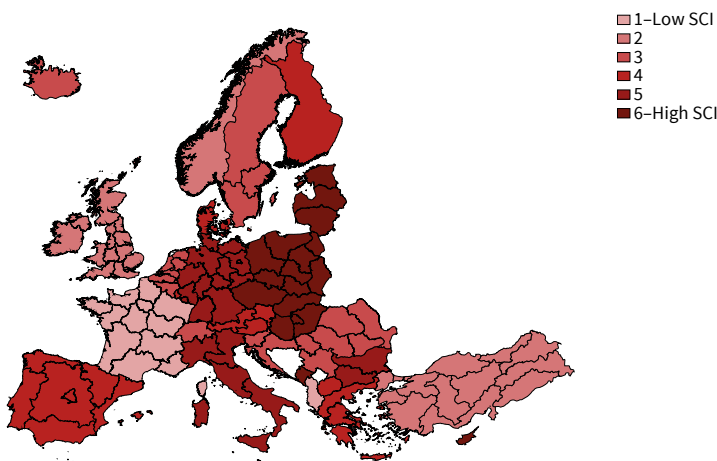
$$(2) \text{ SCI Deviation}_i = \frac{\text{SCI}_i - \text{SCI}_w}{\text{SCI}_w}$$

$$(3) \text{ Combined Weight}_i = \text{Population Weight}_i * (1 + \text{SCI Deviation}_i)$$

Table 1 shows the population weight, SCI deviation, and the new combined weight for each country. Considering social connections greatly influences the weighting of countries within the EU.⁶ For Czechia, Poland, Estonia, Latvia, and Hungary, the combined weight deviates the most from the population weight due to a strong social connectedness to Ukraine. For example, Poland’s SCI to Ukraine deviates by 303.6 percent from the aggregated EU SCI. Accordingly, a Ukrainian is about four times as likely to have a Facebook friendship link with a given person in Poland than with an average person in the EU. As a result, the probability of an existing Facebook link between a person in Ukraine and a person in the EU being to Poland is 34 percent. If social connections were the only determinant for the refugees’ location

⁶ The resulting counterfactual distribution is also broadly in line with results of a survey by the Kyiv International Institute of Sociology on the intended migration destinations of Ukrainians in 2018. Within the EU, Poland, Czechia, Germany, and Italy were the most chosen countries: 36 percent planned to move to Poland, 12 percent to Czechia, 11 percent to Germany, and 5 percent to Italy. Outside the EU, Russia and the US were the most popular migration destinations, with 7 percent and 6 percent, respectively (Kyiv International Institute of Sociology 2018).

Figure 3
Social Connectedness of Europe to Ukraine



Notes: Countries are split into 6 nearly equal groups according to their SCI. Darker colors correspond to higher SCI values.
Source: Humanitarian Data Exchange; authors’ calculations.

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Table 1
Combined Weight Based on Population and SCI for EU Countries

Country	Population (million, 2019)	Population weight	SCI deviation	Combined weight
Poland	37.97	8.5%	303.6%	34.3%
Italy	59.82	13.4%	-7.4%	12.4%
Czech Republic	10.65	2.4%	403.7%	12.0%
Germany	83.02	18.6%	-36.2%	11.9%
Spain	46.94	10.5%	-55.5%	4.7%
Hungary	9.77	2.2%	105.2%	4.5%
France	67.18	15.0%	-78.4%	3.2%
Slovakia	5.45	1.2%	44.8%	1.8%
Bulgaria	7.00	1.6%	3.8%	1.6%
Romania	19.41	4.3%	-65.4%	1.5%
Portugal	10.28	2.3%	-38.1%	1.4%
Netherlands	17.28	3.9%	-68.9%	1.2%
Austria	8.86	2.0%	-41.0%	1.2%
Belgium	11.46	2.6%	-55.8%	1.1%
Greece	10.72	2.4%	-53.8%	1.1%
Latvia	1.92	0.4%	125.0%	1.0%
Sweden	10.23	2.3%	-60.7%	0.9%
Estonia	1.32	0.3%	196.7%	0.9%
Lithuania	2.79	0.6%	34.4%	0.8%
Finland	5.52	1.2%	-49.6%	0.6%
Denmark	5.81	1.3%	-52.9%	0.6%
Ireland	4.90	1.1%	-72.7%	0.3%
Croatia	4.08	0.9%	-69.1%	0.3%
Cyprus	0.88	0.2%	41.2%	0.3%
Slovenia	2.08	0.5%	-61.8%	0.2%
Malta	0.49	0.1%	-27.7%	0.1%
Luxembourg	0.61	0.1%	-45.3%	0.1%

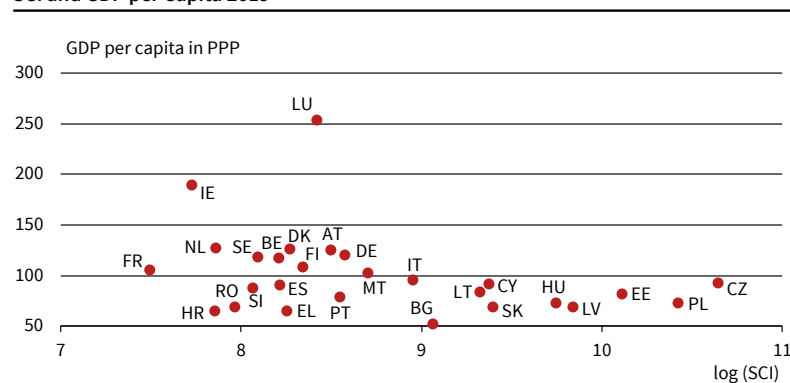
Source: Eurostat; Humanitarian Data Exchange; own calculations.

choice, this would translate into a share of 34 percent of Ukrainian refugees in the EU seeking shelter in Poland. Given its population weight of only 8.5 percent, Poland is therefore likely to be disproportionately affected and to remain the country with the highest number of Ukrainian refugees. In contrast, Germany, as the largest EU country, has a below-average social connection to Ukraine. Its weight decreases from a population weight of 18.6 percent to a combined weight of 11.9 percent. Based solely on social connections, Germany would be only the fourth most attractive country, behind Poland, Italy, and Czechia. However, as discussed by Brücker et al. (2022a), Germany's economic strength may attract a larger share of refugees than would be expected based on its social connectedness to Ukraine.

It becomes evident that the countries that are the most likely to be disproportionately affected by an influx of Ukrainian refugees due to their strong social connection to Ukraine, namely the Czech Republic, Poland, Estonia, Latvia, and Hungary, are among the economically weaker EU countries. Figure 4 plots the natural logarithm of the SCI against GDP per capita

in purchasing power standards. The two are negatively correlated ($\rho = -0.35$). While the named Eastern European countries have a relatively low GDP per capita, countries with the strongest GDP per capita, such as Luxembourg, Ireland, and the Netherlands are expected to see a disproportionately low inflow of refugees. The affectedness of the Eastern European

Figure 4
SCI and GDP per Capita 2019



Source: Eurostat; Humanitarian Data Exchange; authors' calculations.

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countries might be even greater in the short-term due to their geographical proximity to Ukraine. Even though the EU has already granted cohesion funding for strongly affected member countries to support Ukrainian refugees (European Commission 2022b), such an unequal distribution may call for further political action regarding cost-sharing at the EU level (Darvas 2022).

TARGETED REGIONS WITHIN GERMANY

A further advantage of the SCI is that it can also be used on a more granular level to determine the attractiveness of regions within countries to Ukrainian refugees based on their social connections.⁷ As an example, we analyze the heterogeneity between regions in Germany with respect to their social connectedness to Ukraine. SCI values of each German county (NUTS 3) to each Ukrainian oblast (GADM 1) are given. Since we are interested in the social connectedness of German counties to Ukraine as a whole, the SCIs are aggregated. Following Bailey et al. (2021), we take the population-weighted mean of the SCIs to the Ukrainian oblasts for each German county, resulting in one SCI to Ukraine per county.⁸

Figure 5 shows the social connectedness to Ukraine on county level. Baden-Baden, which also has the largest share of Ukrainian citizens in Germany, has the highest SCI to Ukraine, followed by the cities Schweinfurt, Berlin, and Potsdam. Generally, connections to urban areas are stronger than to rural areas. Table 2 displays the 30 counties whose SCI de-

⁷ The most granular level for the worldwide SCI data is NUTS 3 for the EU, GADM 2 for Northern America and some South Asian countries, and GADM 1 for the remaining countries. Intra-US SCI data are also available at the zip code level.
⁸ Data are not available for all oblasts of Ukraine. The aggregate SCI is therefore calculated based on 21 of the 27 Ukrainian oblasts, which are assumed to be representative for Ukraine as a whole.

viates the most from the aggregated SCI of Germany. It shows that the social connectedness to Ukraine is very heterogeneous even within Germany, which may lead to an unequal distribution of Ukrainian refugees across the German regions.

Within Germany, the intention is to allocate refugees according to the *Königstein* formula, which is given by the federal states' population (1/3) and its tax revenues (2/3) (GWK Bonn 2022). However, according to the responsible minister, Nancy Faeser, refugees continue to choose their location themselves if they have existing social connections.⁹ Identifying the states that are likely to be targeted more frequently by Ukrainian refugees therefore shows not only the counterfactual distribution by social connectedness, but also which states could benefit from applying the Königstein formula because they would otherwise be most likely disproportionately affected.

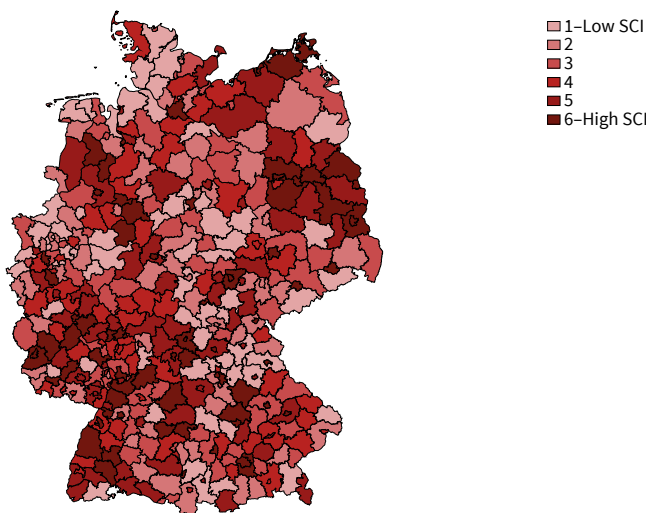
Therefore, the same analysis is performed on the state level as on the country level. For this purpose, the SCI is aggregated by taking the population-weighted mean of all SCIs in a federal state, resulting in one SCI to Ukraine per federal state. Then, following Equations (2) and (3), a combined weight is calculated for each state *i* within Germany, adjusting the population weight by the social connectedness to Ukraine. Table 3 displays the population weight, the refugee share according to the Königstein formula, the SCI deviation, and the new combined weight for each federal state in Germany. Berlin, Hamburg, and Brandenburg have the highest SCI values. For Berlin, in particular, this results in a significantly higher weight of 10.6 percent compared to a population weight of 4.4 percent and a share of 5.2 percent according to the Königstein formula. According to social connections only, the largest shares of refugees in Germany would be expected in the highly populated states of North Rhine-Westphalia, Bavaria, and Baden-Württemberg, which also have to bear the highest shares under the Königstein formula.

CONCLUDING REMARKS

This article shows – by exploiting friendship data from Facebook – that countries within the EU differ substantially with respect to their social connectedness to Ukraine. We argue that these social connections are an important determinant for the choice of destination by people fleeing the war in Ukraine. By activating the Temporary Protection Directive, the EU has paved the way for a more equal distribution of refugees within the EU and relieved the EU's external borders. However, assuming social connections to be a key determinant for the arriving refugees' choice of destination implies that they will nevertheless dis-

⁹ In Zeit Online (2022), "Königsteiner Schlüssel: Geflüchtete sollen nach festen Regeln auf Bundesländer verteilt werden", <https://www.zeit.de/politik/deutschland/2022-03/bundesinnenministerin-fluechtlinge-verteilung-ukraine-koenigsteiner-schlüssel>.

Figure 5
 Social Connectedness of Germany to Ukraine



Notes: Counties are split into 6 equal groups according to their SCI. Darker colors correspond to higher SCI values.
 Source: Humanitarian Data Exchange; authors' calculations. © ifo Institute

Table 2
German Counties with the Highest/Lowest SCI Values

County	Population (thousands, 2020)	Population weight	SCI deviation
Baden-Baden, city	55.45	0.1%	212.1%
Schweinfurt, city	53.32	0.1%	186.2%
Berlin	3664.09	4.4%	141.6%
Potsdam, city	182.11	0.2%	104.4%
Salzgitter, city	103.87	0.1%	99.6%
Frankfurt (Oder), city	57.02	0.1%	88.9%
Memmingen, city	44.36	0.1%	66.8%
Schwäbisch Hall	197.86	0.2%	66.2%
Nürnberg, city	515.54	0.6%	65.4%
Heidenheim	132.81	0.2%	64.5%
Rhein-Neckar-Kreis	548.23	0.7%	63.2%
Hof, city	45.17	0.1%	61.1%
Rhein-Lahn-Kreis	122.57	0.1%	57.1%
Cloppenburg	172.63	0.2%	56.6%
Ingolstadt city	136.95	0.2%	56.6%
Borken	371.90	0.4%	- 53.6%
Herne, city	156.94	0.2%	- 54.5%
Aurich	190.18	0.2%	- 54.8%
Erzgebirgskreis	331.92	0.4%	- 54.8%
Schleswig-Flensburg	202.65	0.2%	- 56.0%
Wilhelmshaven, city	75.19	0.1%	- 56.0%
Ennepe-Ruhr-Kreis	323.13	0.4%	- 56.1%
Wesel	460.11	0.6%	- 56.1%
Remscheid, city	111.52	0.1%	- 57.0%
Olpe	133.36	0.2%	- 57.5%
Uckermark	118.25	0.1%	- 57.7%
Elbe-Elster	101.09	0.1%	- 60.4%
Bayreuth, county	103.68	0.1%	- 60.4%
Wittmund	57.38	0.1%	- 63.1%
Eichsfeld	99.46	0.1%	- 66.3%

Source: Federal Statistical Office Germany, Humanitarian Data Exchange, own calculations.

tribute unequally in the EU. Due to their strong social connection to Ukraine, especially the Czech Republic, Poland, Estonia, Latvia, and Hungary could be disproportionately affected relative to their population and GDP. In contrast, France's and Germany's social connectedness to Ukraine is below-average. Our analysis further shows that also within Germany, some regions might be disproportionately affected by an influx of refugees. Nevertheless, regional characteristics, such as labor market conditions, attitudes and prior exposure to migrants, and integration course offerings significantly impact the integration of refugees and the accompanied fiscal costs (Aksoy et al. 2021; Bailey et al. 2022), which is why they should be taken into account when deciding on a regional allocation of refugees (Brücker et al. 2022b).

The analysis does, however, not account for additional determinants in the refugees' choice of destination. One of them is distance to Ukraine. Since the SCI is positively correlated to distance, this would

imply an even greater imbalance in the distribution of refugees within the EU, with the Eastern European countries, such as Poland and Czechia, being the most severely affected. Another driving factor for the choice of destination is GDP per capita (Ortega and Peri 2013). As shown, the SCI to Ukraine is negatively correlated to GDP per capita for EU countries. In contrast to distance, a greater importance of economic conditions would therefore imply that refugees distribute more equally than what is proposed by their social connections. While GDP per capita may become more relevant over time especially for those who want to stay in the EU, distance is particularly relevant in the short-term, when people seek the closest shelter. Thus, the strongest imbalances in the distribution of refugees within the EU can be expected in the shorter run.

Like in the 2015/16 migrant crisis, the EU might therefore again face a situation where a few of its members are disproportionately affected by an influx

Table 3

Combined Weight Based on Population and SCI for German Federal States

Federal state	Population (million, 2020)	Population weight	Königstein share	SCI deviation	Combined weight
North Rhine-Westphalia	17.93	21.6%	21.1%	-17.2%	17.9%
Bavaria	13.14	15.8%	15.6%	-2.3%	15.4%
Baden-Württemberg	11.10	13.4%	13.0%	4.9%	14.0%
Berlin	3.66	4.4%	5.2%	141.6%	10.6%
Lower Saxony	8.00	9.6%	9.4%	-15.4%	8.1%
Hesse	6.29	7.6%	7.4%	2.7%	7.8%
Rhineland-Palatinate	4.10	4.9%	4.8%	-1.8%	4.8%
Saxony	4.06	4.9%	5.0%	-7.4%	4.5%
Brandenburg	2.53	3.0%	3.0%	16.2%	3.5%
Hamburg	1.85	2.2%	2.6%	25.9%	2.8%
Schleswig-Holstein	2.91	3.5%	3.4%	-27.4%	2.5%
Saxony-Anhalt	2.18	2.6%	2.7%	-19.8%	2.1%
Thuringia	2.12	2.5%	2.6%	-21.3%	2.0%
Mecklenburg-Vorpommern	1.61	1.9%	2.0%	-1.1%	1.9%
Saarland	0.98	1.2%	1.2%	-16.3%	1.0%
Bremen	0.68	0.8%	1.0%	7.7%	0.9%

Source: GWK Bonn, Federal Statistical Office Germany, Humanitarian Data Exchange, own calculations.

of refugees, and it is challenged to act in a coordinated way. In 2015, Greece and Italy were particularly hard hit as transit countries at the EU's external borders. The highest numbers of asylum seekers arrived in Germany, Hungary, and Sweden (European Commission 2016). Now, especially countries that used to block EU migrant quotas in the past, namely Poland, Hungary, Czechia, and Slovakia, are among the ones that would benefit the most from cost-sharing at EU level (Bauerová 2018). For example, Brücker (2022) argues for a fair distribution of costs according to countries' population and economic strength, resulting in a material compensation for the most severely affected member countries. The overall fiscal costs crucially depend on the unpredictable total number of refugees staying in the EU and thus on the further course of the war in Ukraine. Relying on estimates for the costs of the 2015/16 migrant wave, the costs per person per year would range between 9,000 and 25,000 euros (Darvas 2022). However, in contrast to 2015/16, Ukraine's strong social connections to the EU may contribute to lowering these costs per person on average. Due to their existing connections, a large share of refugees are accommodated privately and can get assistance from their acquaintances. The observed positive attitude towards incoming refugees also benefits the social and economic integration (Aksoy et al. 2021). Furthermore, data on the characteristics of earlier Ukrainian migrants suggests a relatively high level of education among incoming refugees (Brücker 2022). A successful integration of refugees into the labor market could therefore also contribute to economic gains, especially in countries currently affected by a shortage in skilled labor, such as Germany (Sauer and Wollmershäuser 2021).

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