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Felix Stips
Krisztina Kis-Katos

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Felix Stips
University of Göttingen and University of Stellenbosch

Krisztina Kis-Katos
University of Göttingen and IZA

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ABSTRACT

Ethnic Networks and the Employment of Asylum Seekers: Evidence from Germany[1]

Using novel registry data on the population of asylum seekers in Germany for the period from 2010 to 2016, and quasi-experimental variation induced by German allocation policies, we identify causal effects of the size and composition of local co-national networks on formal labor market access of asylum seekers. While the individual employment probability is not linked to network size, it increases with the number of employed local co-national asylum seekers and decreases with the number of non-employed network members, thereby underlining the central importance of network quality.

Corresponding author:
Krisztina Kis-Katos
Department of Economics
University of Göttingen
Platz der Göttinger Sieben 3
37073 Göttingen
Germany
E-mail: krisztina.kis-katos@uni-goettingen.de

Introduction

Almost forty years after its original formulation by Wilson and Portes (1980), the ethnic enclave hypothesis remains controversial, both among academics and the general public. While assimilationist theories of migration view geographic agglomeration of migrants as impediments to integration (Lazear, 1999), the enclave hypothesis posits that migrant communities function as important points of entry into the host society.

Empirical studies have addressed this controversy, among others, by exploiting refugee dispersal policies to identify the causal effects of the resulting ethnic enclaves. They often yield positive results: enclaves tend to increase job participation and earnings (Edin et al., 2003), and more strongly so for less-skilled migrants (Damm, 2009). The main driver of these positive results is network quality: 'high-quality' networks have strong positive effects, while 'low-quality networks' no or even negative impacts (Schüller, 2016). This is in line with endogenous network models, where employed members are able to share job-relevant information with non-employed members within the network, thereby increasing their employment chances (Topa, 2001; Calvo-Armengol and Jackson, 2004; Wahba and Zenou, 2005; Beaman, 2011). Hence, the labor market status of the co-national network members should be a central factor behind network effects.

This paper re-investigates these findings using a hitherto unused large administrative data source on asylum seekers in Germany. We contribute to the literature by (i) adding new results on the most recent wave of refugees in Germany, evidence on which is still limited, (ii) specifically addressing asylum seekers, a migrant population that has not been studied quantitatively in this context so far, and (iii) comparing results based on classical network size and quality models to a dynamic cohort model as proposed by Beaman (2011).

Literature Review

The majority of the literature emphasizes the positive role that diaspora networks play in access to employment and income of migrants and refugees (for reviews see Kindler et al., 2015; Schüller, 2016). The common argument embedding these optimistic findings is that networks are more important for migrants relative to 'natives' as their alternatives to finding jobs are more restricted. These restrictions may be viewed in terms of labour market discrimination or of disadvantages in host country specific human capital. The marginal utility of using social ties for employment search will in turn be higher (Kalter and Kogan, 2014). Sorting migrants into ethnic communities is therefore an important aspect in this area of research. A number of studies confirm this observation of unequal selection, whereby it is particularly low-skilled and vulnerable migrants living in ethnic enclaves (Borjas, 1992; Edin at al., 2003; Drever and Hoffmeister, 2008; Damm, 2009).

Self-selection may also be of interest in view of the heterogeneous network effects researchers began documenting with respect to the 'quality of networks'. Both theoretical and empirical studies from economics confirm this crucial importance of network quality (Calvo-Armengol and Jackson, 2004; Wahba and Zenou 2005; Patacchini and Zenou, 2012; Andersson et al. 2014). Empirical implementations usually conceptualize quality as income, education, or (self-

) employment rates (Schüller, 2016). For instance, Edin et al. (2003) use both annual labour income as well as share of self-employment and identify the enclave effect based on quasi-random dispersal policy of refugees in Sweden. They find that benefits of networks were concentrated among those refugees with economically well-off networks. When they included interaction measures of the network quality, then the overall positive effect of ethnic network on earnings vanished, while strong positive effects of network quality were found.

Conceptually, the literature differentiates between the information channel and the social norms channel of ethnic networks (Bertrand et al., 2000). The information channel stipulates that relevant information is shared with members of the network, but not with outsiders. This may be achieved indirectly by the provision of information about employment opportunities or directly by the referral of candidates to employers (Dustmann et al. 2015). From a search-model perspective, both are equivalent to an exogenous increase in the job arrival rate which increases the likelihood of accepting a random job offer (Goel and Lang, 2019). The majority of reviewed models further endogenise this job arrival rate. Following the canonical setup in Calvo-Armengol and Jackson (2004), the arrival rate in these models depends on network quality, i.e. the employment rate of other members in the network.

An interesting stream of research further focuses on the transmission of job-related information through the network, and specifically on the relationship between network size and information transmission (Wahba and Zenou, 2005; Beaman, 2011). In a general equilibrium setting, a larger network may mean more information, but also more competition from similar applicants. For example, Beaman (2011) develops a dynamic search model of competition for job-relevant information within the network. At each period, agents receive random job offers, which they pass on to other members of the (ethnic) network if they are currently employed, thereby increasing job chances of non-employed members of the network. Exogenous increases in the number of migrants lead to increased competition for this information within the social network and thus lead to an initial negative shock to employment probabilities. Over time, this effect is dampened, and even reversed as an increasing number of migrants enter the labour market, which increases the overall quantity of valuable information.

The social norms channel highlights the importance of peer groups to affect individual decision-making. Labour market access may be affected directly through changes in work ethics, entrepreneurship attitudes, or labour division within the household (Burns et al., 2010), or indirectly through impacts on the fertility rate and human capital accumulation (Damm, 2009), in particular host country specific skills (Lazear, 1999). Recently, Battisti et al. (2016) develop and empirically confirm a two-period search model that focuses on the trade-off between human capital investments and job searches. Agents can search for employment both through a formal and an informal, i.e. network, channel. In the first period, immigrants can decide whether to invest in capital, and have higher chances via the formal channel in period two, or search directly for a job. A larger co-ethnic network implies higher chances of finding a job directly through the informal channel. It thus decreases the incentives to invest into human capital after arrival. Both effects are amplified by a higher initial human capital endowment. In the long run, the lower human capital endowments lead to job-skill mismatches and lower wages.

In summary, the effect of ethnic enclaves on the labour market participation of migrants and refugees is theoretically and empirically ambiguous. It may be viewed as a composite effect between positive short-term information effects and negative long-term human capital effects. The effects vary in quality and size of the network, as well as characteristics of the migrant. As the present research focuses on short-term effects, we would however expect positive effects on labour market integration of refugees.

Data

We use novel administrative data on asylum seekers from 2010 to 2016 (RDC, 2017). The pooled yearly cross sections cover all asylum welfare benefit recipients, resulting in an almost complete census of asylum seekers in Germany during the analysed time period. Limiting the sample to male, working-age (18 to 65) asylum seekers who reside outside first reception centres and originate from forty-four main countries of origin yields a sample of approximately one million observations (see Table 3 in the Appendix for an overview). The focus on main countries of origin keeps 95% of asylum seekers in the sample but allows us to circumvent a potential threat to our identification strategy: asylum applicants from countries with small refugee populations tend to be assigned to areas where offices of the Federal Office for Migration and Refugees (BAMF) have regional experts (OECD, 2017).

Our main outcome of interest is employment, which takes the value of one if the individual has reported any formal employment during the calendar year and zero otherwise. Our employment definition includes self- and part-time employment, but excludes informal employment arrangements by default, by that potentially underestimating the involvement in local economic activities. Overall, on average about 3% of the asylum seekers in our sample report employment, which is extremely low (see Table 4 in the Appendix for a full list of summary statistics). A strong predictor of individual employment is the time since arrival, which is reflected in Panel A of Figure 1 that plots average employment shares by benefit duration. As expected, the share of employed asylum seekers increases steadily with increasing time spent in Germany. It is worth noting that asylum seekers who have been most successful in the labour market are more likely to exit the asylum welfare benefit system over time and hence disappear from the administrative records. To account for this dynamic, our empirical results always control for individual welfare benefit duration. Nonetheless, we can only identify current benefit claimants in any given year. As can be seen from Panel B of Figure 1, employment shares varied considerably over time, first declining steadily in the period between 2010 to 2015 from initially around 7% to the record low of under 2% in 2015, while then rising again to 4% in 2016. This reflects strong composition effects, driven by the higher share of newly arrived asylum seekers in 2015, but potentially also a general overburdening of the system during this year.

Figure 1: Employment Shares by Year and Benefit Duration

Panel A: Employment Share by Year   *Panel B: Employment Share by Benefit Duration*
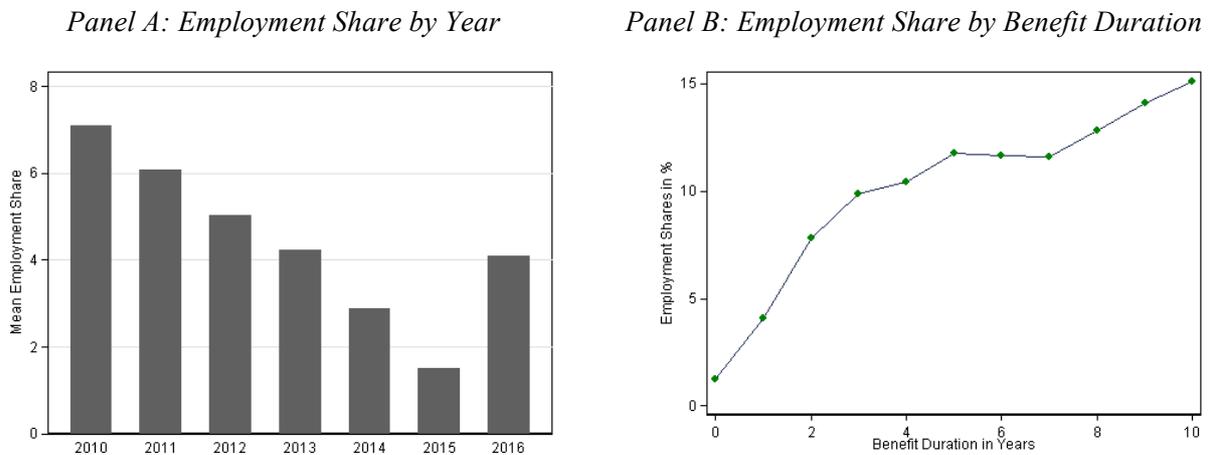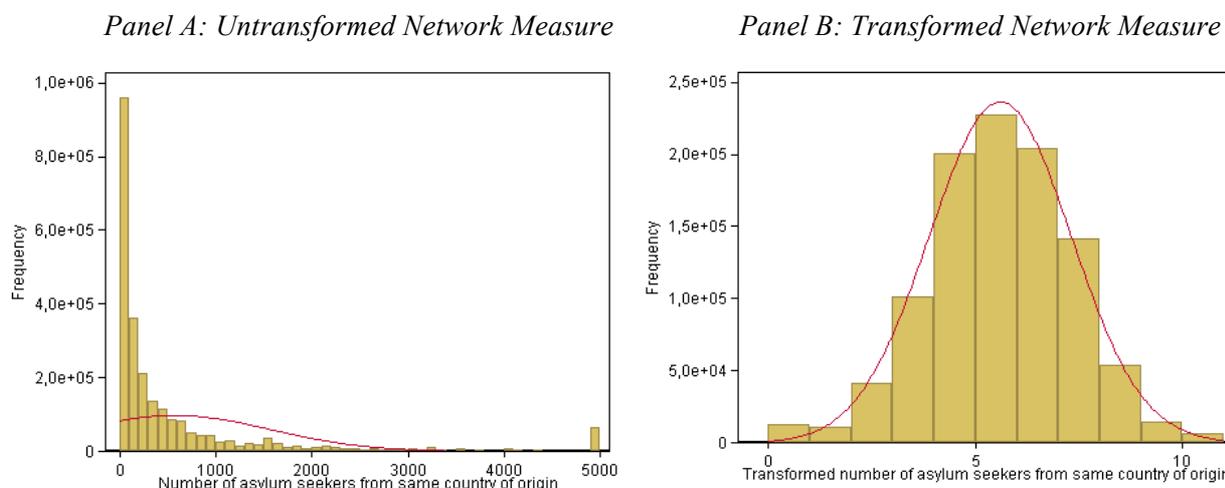

Source: RDC (2017), own calculations. Notes: Employment refers to any formal employment during calendar year. Mean is based on the sample size for that respective year.

We further measure job quality using information about part- and full-time employment (in separate dichotomous variables).[2] Full-time work is defined if the working hours in formal employment are at least equal to the regular working hours defined by the national legislation or respective collective bargaining agreement. Although the thresholds vary by sector and occupation, usually full-time employment will involve a 35 to 40 hour working week, while part-time working hours will be significantly lower. The majority of employed asylum seekers work in a part-time contract (compare Table 4).

Our explanatory variable of interest is the local ethnic network, based on the number of co-national asylum seekers residing in the same county within the same year. We also decompose this network measure by employment status, cohort, and age group of the co-national asylum seekers. Cohorts are calculated using completed years of welfare benefit duration as a proxy for time since arrival. We normalize our network measures taking the inverse hyperbolic sine transformation, coefficients of which can be interpreted similarly to a log function. Figure 2 on the next page plots the distributions of the transformed and untransformed asylum network variable and shows that while the untransformed measure is highly skewed to the left, the transformed measure exhibits an almost perfect log-normal distribution. While ordinary least squares estimation does not impose distributional restrictions on the independent variables, the transformed network size measure is better suited to capture decreasing marginal returns from network size to the likelihood of finding employment.

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[2] The assumption is then that full-time employment is in general preferable to part-time engagements. This may be motivated firstly be the fact that part-time employment often encompasses a wage penalty (O'Dorchai et al., 2007). Secondly, we expect that in our sample of predominantly young and migrated men income effects should dominate substitution effects between leisure and income.

Figure 2: Transformed and Untransformed Asylum Network Histogram

Panel A: Untransformed Network Measure   *Panel B: Transformed Network Measure*

Source: RDC (2017), own calculations. Notes: In Panel A, the x-axis measures the numbers of co-national asylum seekers from the same county of origin residing in the same county, while in Panel B it refers to the inverse hyperbolic sine of the same measure. The bandwidths are set to 100 in Panel A and 1 in Panel B. In both figures, the y-axis indicates the respective frequencies, and the red line represents a normal distribution with same mean and standard deviation.

All employment regressions are conditioned on a set of individual and household characteristics. These include age, benefit duration in months as a proxy for time spent in Germany, non-labour income, household size and a set of dichotomous variables indicating whether the person is household head, has children, resides in private accommodation, and whether his or her case is administered by a supralocal carrier. This latter means that social registry administration lies in the responsibility of an agency at higher administrative level than the municipality, thus proxying administrative differences between districts.

One crucial drawback of the registry data is that it contains only limited individual information.[3] The employment regression will by default suffer from omitted variable bias, by not controlling for relevant determinants of labour market success. The most important of these appear to be education and work experience. While this not optimal, the analysis without the inclusion of these indicators is defensible for at least three reasons. Firstly, in general, data on foreign education qualifications tend to suffer from considerable measurement error. Secondly, using nationality-year fixed effects allows to control for time-varying differences in educational attainment between asylum seekers from different groups. Thirdly, the quasi-experimental distribution of asylum seekers across German counties allows for the exclusion of these variables. The identifying assumption is then that the placement policy removes all dependence between location of the asylum seekers and unobserved individual characteristics, most importantly education. The following section will describe the German refugee dispersal policy and link its features to the necessary identifying assumptions.

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[3] Since this data is used by the public authorities throughout the asylum procedure, it does not contain more information than necessary as that information may bias the decision.

Institutional Background

The main identification problem regarding the causal effect of migrant networks on their labour market outcomes lies in the endogenous sorting of migrants. Location choice is determined by both the expected employment prospects and the presence of other migrants, as migrants tend to settle in larger cities with a higher presence of ethnic minorities (Borjas, 1999; Åslund, 2005). The relative importance of these factors will be affected both by observable and unobservable characteristics of the observed migrants, such as willingness to assimilate or innate ability. A failure to account for these will lead to biased estimates of the causal effect of the ethnic enclave on employment and wages. While some studies try to overcome the sorting and ability bias by conditioning their results on a large set of observable characteristics and multi-level fixed effects, this study is part of another string of the literature that uses refugee dispersal policies to generate quasi-random variation in the location choice of migrants (Åslund, 2005; Edin et al. 2003, Damm, 2009). As such, this section will describe the German dispersal procedures in some detail and link these to the identifying assumptions required to identify the causal effect of ethnic enclaves on employment of migrants.

Due to the federal political architecture of Germany, different tasks of the asylum procedure are administered at different levels of government. While the asylum application is administered at the national level by the BAMF, accommodation and social assistance is a responsibility of the federal governments. Given the arising financial expenses for local governments, it has been the foremost objective of German dispersal policy to spread the arising financial burdens evenly across states (EMN, 2014). The main instrument used to achieve this is the 'Königssteiner Schlüssel', which assigns the number of refugees each state must take based by two thirds on the population shares and one third the relative tax revenues, each of the penultimate year. Additionally, allocation decisions at the state level also take into account current housing availability as well as nationality (Geis and Orth, 2016; Kalkmann, 2017). However, in practice the distribution largely mirrors the population distribution in Germany (Gehrsitz and Ungerer, 2018; OECD 2017). Panel A of Figure 3 on the following page supports this view. The average share of asylum seekers receiving asylum welfare benefits compared to the county population size is below 1% for all counties. Overall, the differences between counties are minimal and there appears to be no clear pattern in distribution.

Figure 3: Geographical Variation in Local Asylum Seeker Networks

Panel A: Share of Asylum Seekers in Total Population   *Panel B:Network Size*
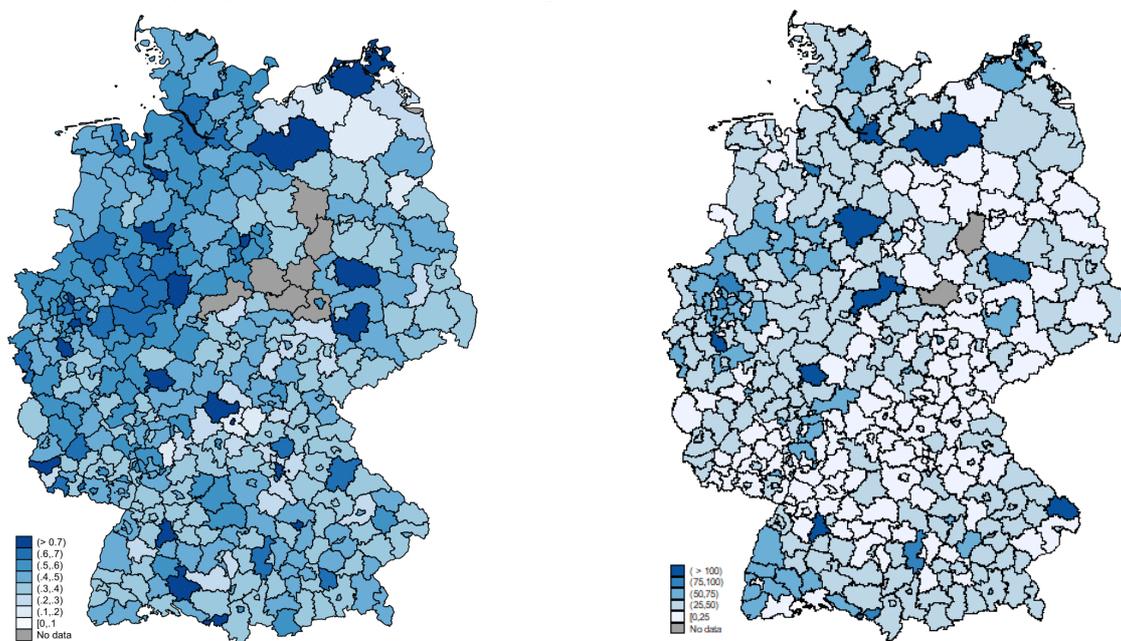
Source: RDC (2017), own calculations. Notes: Maps show means over the period of observation. Total population is based on Census 2011. Data for counties in grey is not displayed due to confidentiality reasons.

At the state level, distribution is mostly performed in a two-stage procedure. Asylum seekers registered in the EASY-system and reside in first reception centres ('Erstaufnahme-einrichtungen') for a period of at least six weeks and up to six months (Battisti et al. 2019). After this waiting period, they are re-allocated to the assigned municipalities, with procedures varying to some degree between states. By far the most common approach, adopted by nine out of sixteen state authorities, is to fix a distribution key at the county level directly proportional to relative population shares. In North Rhine-Westphalia, the population criterion is added with an area measure, while Berlin engages in a consultative process between state and civil society organisations (Wendel, 2014a). The remaining states, Thüringen, Bremen, Schleswig, and Bavaria employ fixed quotas by decree. These quotas remained largely unchanged over the period of observation. While asylum seekers can submit formal request to be (re-)allocated in another county no legal right guarantees their wishes are taken into consideration, except in the case of family reunion (Flüchtlingsrat Niedersachsen e.V., 2018). Also, acceptance rates are generally low and claims granted only in very exceptional circumstances (Kalkmann, 2017). Thus, although procedures vary between states, they share a common feature: allocation is very rarely linked to individual wishes, economic prospects, cultural proximity, or even the capacity of municipalities to host asylum seekers (Geis and Orth, 2016). Empirically, Gehrsitz and Ungerer (2018) confirm this when they find no significant correlation between socioeconomic characteristics and number of asylum seekers at the county level.

The allocation of refugees in Germany did not only have the aim to spread financial obligations evenly but also to prevent the agglomeration of foreigners in certain areas. To achieve this goal, the allocation within the federal state is accompanied by a legislative restriction on the freedom of movement of asylum seekers. The domicile obligation ('Wohnsitzauflage') confines the place of residence of asylum seekers to their assigned district, while the residence obligation ('Residenzpflicht') imposes restrictions on movements outside this district (Frei and Kluge, 2016; Dehos, 2017). An infringement of these regulations entails an administrative offence including a monetary fine and, in case of repeated occurrence, negative consequences for the prospects of receiving a permanent residence permit (Wendel, 2014b). Throughout the period of observation, there have been a number of legislative changes, a full depiction of which goes beyond the purpose of this section. A series of liberalizations at the state-level in the period between 2010 and 2014 relaxed the freedom of movement (ibid.), which in 2015 resulted in an abolition of the residence obligation for applicants with high prospects of staying (Wiegandt, 2018). Importantly for the identification strategy in this paper, these changes however only applied to those who are not receiving welfare benefits according to AsylbLG (Dehos, 2017). In 2016, these relaxations were quickly revoked with the enacted of the 'Integration Act'. Under this act, the domicile obligation may even be applied to approved refugees for a period of one to three additional years (Frei and Kluge 2016).

Identification Strategy

The usage of historical episodes of exogenous migration shocks is well-established in migration economics (Tumen, 2015). In particular, episodes in which allocation policies of migrants or refugees within a country generate variation in the location of migrants, are of interest to the literature. In the German context, the most important episodes so far have been the Guest-worker programme during the 1960's and 1970's as well as the return of ethnic Germans during the 1990's (Danzer and Yaman, 2013; 2016; Bauer and Zimmermann, 1997; Piopiunik and Ruhose, 2017; Glitz, 2012). The most recent wave of refugee migration to Germany has been exploited by some studies (Gehrsitz and Ungerer, 2018; Dehos, 2017) for a difference-in-difference identification strategy using the number of allocated asylum seekers to investigate its impact on regional outcomes. Our study is related to this literature on German refugee (or migrant) placement in that it uses the quasi-experimental variation generated through the current institutional setup, but with the key difference that in contrast to taking a regional approach, our analysis is conducted at the level of the individual asylum seeker.

Our study is more closely linked to the literature that uses refugee dispersal policies to investigate the impact of differing migrant densities on the labour market outcomes of refugees (Edin et al., 2003; Damm, 2009; Beaman, 2011; Andersson, 2018). The instrumental variable approach allows to control for the sorting bias that arises if refugees move away from their initially allocated location. Our identification is most closely linked to the strategy used in Beaman (2011). She focuses on the labour market outcomes of refugees in the first 90 days after arrival without using an instrumental variable strategy. The implicit assumption is then that shorter time horizon prevents endogenous sorting along ethnic dimensions, which studies that address a longer time horizon address by instrumenting the current enclave size with historical numbers of allocated asylum seekers (Edin et al., 2003; Damm, 2009; Andersson, 2018).

The identification strategy of this study follows her approach based on the German dispersal policy of asylum seekers during the observation period between 2010 and 2016. We use the variation in the ethnic composition of migrants and asylum seekers in German counties to compare the labour market outcomes of those living in areas with a higher number of co-nationals to those living in areas with a lower number of co-nationals. Consistent estimation requires the model residual to be uncorrelated with the measure of migrant networks. Our identifying assumption is that yearly variation in local network size is independent of unobserved characteristics of the asylum seekers. Two main institutional features are required for this assumption to hold. Firstly, the allocation decision itself must not be based on unobservable characteristics of asylum seekers. Secondly, ex-post sorting must be negligible, specifically in terms of independence from relevant unobserved characteristics. In the following, we argue that both assumptions are met to a large extent and present the measures taken to further increase the credibility of our approach.

For the purposes of identification, the allocation policy of asylum seekers within Germany provides a close to ideal policy experiment. As we focus on asylum seekers which are still restricted by the German asylum policies, this allows us to directly estimate the causal effects without the need to use an instrumental variable approach. Firstly, the centralized administration through the EASY system, which decouples the point of entry into Germany from the final place of residence, nullifies any spatial dependencies between the two. Secondly, the administrative separation between the asylum procedure and the allocation procedure ensures that the authorities have minimal information about the asylum seekers' background, thereby ruling out selection on unobservable characteristics. In fact, the allocation decision almost completely neglects the individual wishes of the applicant. Importantly, employment prospects and cultural proximity are not considered as substantial reasons by the authorities (Geis and Orth, 2016). Lastly, the restrictions to movement as part of the domicile and residence obligations ensure that ex-post sorting is reduced to a minimum. In summary, we argue that both the random allocation as well as the no ex-post sorting assumption hold to a large degree because i) the asylum and the allocation procedures are administratively separated, ii) the allocation neglects asylum seekers' preferences, and iii) the domicile and residence obligation limit sorting according to unobservable characteristics to a minimum.

To further ensure the credibility of our identification strategy, we follow the previous literature and measure the enclave size at a relatively larger administrative unit. As suggested by Bertrand et al. (2000) and Cutler and Glaeser (1997), the location decision of migrants is influenced more by the number of co-ethnics within different parts of a city, but less so by their presence in a larger region. In our case, we decide to measure the enclave size at the county level, instead of the municipality level. Assuming that this measure is still a valid proxy of ethnic ties, this approach ensures identification while allowing for ex-post sorting within counties (Danzer and Yaman, 2013). In view of previous results, we believe that measuring the enclave at the county level may be a valid approach. For example, Patacchini and Zhenou (2012) investigate the effects of the network with regard to proximity and find significant positive network effects for up to one hour travel time. According to the results from the last census in 2011, the mean size of the 431 German counties was around 900 km^2, which should be well reachable within an hour. This means that positive effects may also be found at the county level and not only at the municipality level.

Beyond the main specification that focuses on the local size of the co-national network, we further decompose the network size variable according to characteristics of the network

members, relying on the time since arrival, employment status and age of the co-national asylum seekers. The strength of identification varies across these decompositions. Whereas due to the placement policies, we consider the number of co-national network members as exogenously given in any location, this is not necessarily through to the same extent for all decomposed measures. A decomposition of network size by cohort of arrival or age requires that the dispersal policy does not condition the placement of asylum seekers on their own characteristics (age) or on placement history (arrival cohort size). To the best of our knowledge, this has not been the case in Germany and hence the results on network size by age or arrival cohort can still be interpreted in causal ways. However, our decomposition of network size by employment status is conditioning on a variable that is in itself endogenous as it responds to local economic conditions. Thus, results on the network size by employment status should be interpreted with more caution and only conditional on the various fixed effects used for estimating the model.

Estimation Strategy

We investigate the impact of co-national asylum seekers' proximity on individual employment by estimating a three-way fixed effects model:

$$Y_{ijkt} = \alpha_0 + \gamma_1 N_{jkt} + X_{ijkt}\beta + \theta_{jt} + \vartheta_{kt} + \tau_{jk} + \epsilon_{ijkt} \tag{1}$$

where Y_{ijkt} is the employment probability of asylum seeker i of nationality j, residing in county k in year t. Our main variable of interest is given by N_{jkt} that measures transformed network size by the number of co-national asylum seekers residing within the same county (also sub-divided by employment status, cohort and age). The vector of individual controls X_{ijkt} includes indicators for age in five-year intervals, household size, residential status, welfare benefit duration, the size of non-labor income, non-local support facility, and indicators for parents and household heads.

Crucially for our approach, we also control for multiple non-nested sources of variation by an extensive set of fixed effects that capture several different sources of heterogeneity in employment status and help to identify time- and location-specific variation across asylum seekers of various nationalities living within the same location. The nationality-year fixed effects θ_{jt} factor out common country-wide employment trends among asylum seekers coming from each of the forty-four origin countries. For instance, they factor out the on average lower probability of Syrian refugees to enter employment in Germany at the height of their influx in 2015 and 2016, irrespective of their place of living. A set of county-year fixed effects ϑ_{kt} controls for idiosyncratic variation in local labour market conditions in each county as well as the yearly numbers of total asylum seekers assigned to a locality. They capture all location-specific shocks over time that affect the employment probability (both from the side of labour demand and labour supply) of all asylum seekers within a given county irrespectively of their nationality. Finally, the time invariant county-nationality fixed effects τ_{jk} capture nationality-specific local labour market characteristics in each county, reflecting for instance the historical presence of co-national networks. For instance, in a county with a relatively larger Afghan diaspora, Afghan refugees may receive more assistance to enter the labour market than those from other nationalities in any given year. Our preferred specifications partial out this average

difference by the county-nationality fixed effects and consider only idiosyncratic variation in Afghan refugees' employment within a county over time.

The treatment effect, γ, is thus given by comparing the difference in employment probabilities linked to co-national network size between each nationality within a county and the same year, to the difference between the effects of the same group in another county. We estimate equation (1) by a linear probability model with three-way fixed effects (Guimarães and Portugal, 2010) and cluster all standard errors at the nationality-county level.[4]

Results

Table 1 reports the network coefficients from regressions on the probability of employment. In each panel, column (1) reports unconditional coefficients, while column (2) reports the full specification as in equation (1).

Table 1: Employment Effects of Co-National Networks

Dep. Variable: Employment						
	(1)	(2)			(1)	(2)
Panel A			Panel B			
Network Size	-0.005***	0.000	Network Size of Employed		0.026***	0.013***
	(0.001)	(0.001)			(0.001)	(0.001)
				Non-employed	-0.015***	-0.009***
					(0.000)	(0.001)
Panel C			Panel D			
Network Size by Cohorts			Network Size by Age			
same	-0.009***	-0.001***	0 - 18		-0.003**	0.000
	(0.000)	(0.000)			(0.001)	(0.001)
t-1	-0.001**	0.000	19 - 25		-0.006***	-0.004***
	(0.000)	(0.000)			(0.001)	(0.001)
t-2	0.002***	0.000	26 - 35		-0.007***	-0.001
	(0.000)	(0.000)			(0.001)	(0.001)
t-3	0.002***	0.000	36 - 65		0.006***	0.005***
	(0.000)	(0.000)			(0.001)	(0.001)
t-4	0.002***	0.000	> 65		0.007*	0.002*
	(0.001)	(0.001)			(0.004)	(0.001)
Further controls	*No*	*Yes*			*No*	*Yes*

Source: RDC (2017), own calculations. Note: Definitions of dependent and controls are described in the text. Standard errors in parentheses are clustered at the county-nationality level. N=985,850 in panel A, B and D, N= 958,144 in panel C. Significance levels * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

In column (1) of Panel A, we see a negative correlation between local network size and the likelihood of employment. With a 100 log points increase in local network size (which is more than doubling the network size), the individual probability of employment declines by 0.5 percentage points, which is about 17% of the average employment in the sample (which is

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[4] The interested reader may object that due to the small number of employed asylum seekers, a nonlinear specification should be favored. However, this would have required using nested fixed effects and has its own weaknesses in case of rare events, in particular the incidental parameter problem (King and Zeng, 2001).

0.03). However, once we control for observed individual characteristics, nationality- and county-specific variation in labour market conditions over time as well as nationality-county-specific average differences in column (2), no link remains between network size and individual employment. Thus, in places where and in times when the number of local co-national asylum seekers is high, fewer of them are able to enter the German labour market but this can be explained by more general national and local labour market conditions and does not strictly depend on the size of the co-national network itself.

However, more co-national asylum seekers in the same county imply at the same time a larger network with presumably positive employment effects, but also an increase in the ethnic-specific labour supply increasing job market competition. We study these effects in the remaining panels by splitting the composite network measure by employment status, cohort, and age group, and find significant compositional heterogeneities.

The most important of these is network quality, measured as employment within the network (column (2) of Panel B): Individual employment probability increases with the number of employed co-nationals and decreases with the number of non-employed co-nationals living within the same county, also after we control (among others) for variation in local labor market conditions and general nationality-specific trends. An increase in the number of employed co-national network members by 100 log points (or by approximately 170%) leads to an increase in the probability of employment by 1.3 percentage points. This corresponds to an increase of about 40% relative to the sample mean employment rate. At the same time, asylum seekers' likelihood of employment declines by about 0.9 percentage points when the number of non-employed co-national asylum seekers in the county increases by 100 log points. Of course, if local labour demand fluctuations are fully ethnicity-specific, this result could also reflect unobserved local labour demand shocks for employees from certain nationalities. However, we doubt that German county-level labour markets are segregated across each of the main countries of origin of asylum seekers as to render yearly fluctuations of local demand fully nationality specific. Hence, it is more likely that our measures of (non-)employment within the network will also reflect local nationality-specific supply conditions. This result thus shows that living in areas where more co-nationals are in employment is helping the individual labor market success, whereas each additional non-employed network member reduces the likelihood of work.

Splitting the co-national network based on their time of arrival in Germany (using welfare benefit duration as proxy for time since migration), we find weak evidence for cohort-based heterogeneities as documented by Beaman (2011). The unconditional model (column (1) of Panel C) displays the expected pattern to some extent: The likelihood of employment reduces with the size of the own cohort of co-national arrivals, while cohorts that have arrived two years before increase the probability of employment among the more recently arrived, thus pointing towards competition dominating at the beginning, whereas positive effects appearing over time. However, the relatively small effect sizes practically vanish once we introduce a full set of controls in column (2). Only the number of co-nationals arrived within the same year is still significantly negatively linked to individual employment, but the effect is negligible in size.

Moreover, we also find partial evidence for heterogeneities in the age composition of the network (panel D). Being surrounded by additional young (old) co-nationals inhibits (improves) employment prospects: Whereas the younger may act as competitors in the labor market, older network members may function more as mentors. However, in terms of effect sizes, individual

employment outcomes respond much more strongly to the number of employed co-national members than to the numbers belonging to different cohorts by the time of arrival or age.

Table 2 reports the network coefficients from regressions on the probability of employment. In each panel, the left column reports regressions using the dichotomous outcome of part-time employment, while the right panel uses the full-employment as dichotomous outcome. All results are based on the full specification as in equation (1).

Table 2: Part- and Full-time Employment Effects of Co-National Networks

Dep. Variable: Employment					
	Part-time	Full-time		Part-time	Full-time
Panel A			Panel B		
Network Size	0.001	-0.001*	Network Size of Employed	0.011***	0.007***
	(0.001)	(0.001)		(0.001)	(0.000)
			Non-employed	-0.005***	-0.005***
				(0.000)	(0.000)
Panel C			Panel D		
Network Size by Cohorts			Network Size by Age		
same	-0.001***	-0.001***	0 - 18	-0.001**	0.000
	(0.000)	(0.000)		(0.000)	(0.000)
t-1	0.000	0.000	19 - 25	-0.001**	-0.001**
	(0.000)	(0.000)		(0.001)	(0.000)
t-2	0.000	0.000	26 - 35	-0.001**	0.000
	(0.000)	(0.000)		(0.001)	(0.001)
t-3	0.000*	0.000	36 - 65	0.001*	0.001
	(0.000)	(0.000)		(0.001)	(0.000)
t-4	0.001***	-0.001**	> 65	0.004***	-0.001*
	(0.000)	(0.000)		(0.002)	(0.000)
Further controls	*Yes*	*Yes*		*No*	*Yes*

Source: RDC (2017), own calculations. Note: Definitions of the dependent variable and controls are described in the text. Standard errors in parentheses are clustered at the county-nationality level. N= 984,801 in panel A, N= 985,850 in panel B and C, and N= 958,144 in Panel D. Significance levels * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

These results are in line with what we found when using the overall employment indicator, but add some interesting new detail. In Panel A we find a very small and marginally significant negative association between the size of the local co-ethnic network and the likelihood of being in full-time employment, while the association between the enclave and part-time employment is insignificant.

The previously emphasized importance of network quality is confirmed in Panel B, replicating the link between having more employed co-ethnic asylum seekers and larger probability of employment, together with negative employment effects from having more non-employed co-national asylum seekers living nearby. Interestingly however, the effect sizes vary considerably depending on the outcome used. An increase in the number of employed co-national network members by 100 log points leads to an increase in the probability of part-time employment by 1.1 percentage points as compared to 0.7 percentage points for full-time employment. An intuitive explanation for this result is that even when networks are successful at increasing employment, they do so mostly in lower quality jobs. This explanation has been forwarded by

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previous studies in the literature (Chiswick and Miller, 2005; Tu, 2010). However, we would refrain from making strong causal claims in this regard. Firstly, our measure of job quality is only a rough approximation of job quality measured in terms of wages and/or job satisfaction. Secondly, due to bureaucratic constraints, it is likely considerably easier for asylum seekers to work in part-time employment. In Panel C, when splitting the network measure by cohort size, we again cannot confirm the pattern predicted by a dynamic cohort model, neither for part- nor for full-time employment. Regarding the age decomposition, overall the effect sizes are considerably smaller, and again only significant for part-time employment.

Discussion

In this paper, we associated variations in the size of local co-national networks to the employment probability of asylum seekers in Germany and argued that the natural experiment created by the German refugee dispersal policy allows us to credibly identify causal effects between the total network size and employment, also when differentiated by pre-determined individual characteristics of network members (like age). Moreover, under the assumption that yearly fluctuations in local labour demand are not fully ethnicity-specific, we can also link the employment within the network to own employment.

The presented results align well with previous research and add some interesting new insights to this well-established research question. In line with previous studies from Germany (Schaffner and Traude, 2014; Battisti et al., 2018), we find an insignificant composite effect of co-national networks on employment probability and only a weak negative effect on full-time employment. Conditional on local employment prospects, asylum seekers do not seem to be quicker at finding work if surrounded by co-national asylum seekers and are substantially less likely to be employed when the number of non-employed co-national asylum seekers rises. Taken together, this may indicate that the optimistic findings from the U.S. literature on the beneficial effects of co-ethnic networks may not be applied directly to the context of the recent wave of immigrants to Germany.

We also tested for network composition effects by splitting our network measure by employment, cohort, and age. The results underline the central importance of network quality. Having more co-national asylum seekers who are actually in formal work, helps individual employment substantially. By contrast, increasing the number of co-national asylum seekers who are out of work, hinders individual employment prospects. Although these results may also partly reflect idiosyncratic nationality-specific local labour demand shocks, we believe that network quality must also contribute to this differential result. Comparing this canonical explanation with the more recent model by Beaman (2011), we found that the network quality transmission channel is more fitting to the German case. The presence of more co-national asylum seekers who have lived in Germany longer did not increase employment prospects in our sample significantly, when controlling for other covariates. Experience measured in terms of the number of older co-national asylum seekers showed significant positive impacts, albeit less strongly so than the number of employed asylum seekers. We also provided indicative evidence that migrant networks have stronger effects on the likelihood of finding part-time employment, as compared to full-time employment.

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Appendix

Table 3: Sample Countries of Origin

	Country of origin	Number of Observations	Share in %		Country of origin	Number of Observations	Share in %
1.	Syria	206000	20.30	23.	Georgia	9894	0.98
2.	Afghanistan	130369	12.85	24.	Armenia	9784	0.96
3.	Iraq	90525	8.92	25.	Bangladesh	9658	0.95
4.	Pakistan	66209	6.52	26.	Bosnia & Herzegovina	9645	0.95
5.	Iran	45833	4.52	27.	Ghana	8954	0.88
6.	Eritrea	39033	3.85	28.	Ethiopia	8807	0.87
7.	Serbia	32387	3.19	29.	Egypt	7956	0.78
8.	Somalia	28157	2.77	30.	Senegal	6170	0.61
9.	Albania	27570	2.72	31.	Ukraine	5823	0.57
10.	Kosovo	25100	2.47	32.	Tunisia	5790	0.57
11.	India	25052	2.47	33.	Mali	5090	0.50
12.	Nigeria	23287	2.29	34.	Sri Lanka	4259	0.42
13.	Russia	23000	2.27	35.	Côte d`ivoire	4170	0.41
14.	Turkey	21543	2.12	36.	Montenegro	3869	0.38
15.	Lebanon	20077	1.98	37.	Libya	3732	0.37
16.	Algeria	19093	1.88	38.	Sierra Leone	3482	0.34
17.	Macedonia	16502	1.63	39.	Benin	3161	0.31
18.	Gambia	15709	1.55	40.	Togo	1883	0.19
19.	Morocco	12179	1.20	41.	Congo, DRC.	1417	0.14
20.	Azerbaijan	10807	1.06	42.	Kenia	1356	0.13
21.	Guinea	10332	1.02	43.	Angola	897	0.09
22.	Sudan Republic	10202	1.01	44.	Kenia	4350	0.17

Source: Source: RDC (2017), own calculations. Notes: The numbers refer to the sample of male asylum seekers, aged 18 – 65, from the chosen countries of origin. Share in % refers to the total sample size given these restrictions.

Table 4: Summary Statistics

Variable Name	Mean	Standard Deviation	Number of Observations
Employment	0,03	0,13	1014790
Full-time employment	0,01	0,11	1014790
Part-time employment	0,02	0,13	1014790
Age	30,02	9,80	1014790
Benefit duration in months	14,62	24,29	1014790
Non-labour income in €	7,71	93,12	1014790
HH size	1,71	1,46	1014790
HH head	0,89	0,32	1014790
Parent	0,18	0,38	1014790
Private accomodation	0,46	0,50	1014790
Supralocal carrier	0,15	0,36	1014790
Residential status			
Residency Authorization	0,02	0,13	1014790
Temporary residence permit	0,77	0,42	1014790
Return obligation	0,03	0,18	1014790
Family member	0,00	0,06	1014790
Tolerated	0,14	0,35	1014790
Entry via airport	0,00	0,05	1014790
Subsequent asylum application	0,01	0,09	1014790
No. asylum seekers	4360,80	8340,19	1014790
No. co-national asylum seekers	526,03	1452,46	1014790
No. employed co-national asylum seekers	7,50	30,84	1014790
No. not-employed co-national asylum seekers	518,53	1446,50	1014790
No. co-national asylum seekers age below 18	158,26	449,91	1014790
No. co-national asylum seekers age 18 -25	150,53	420,78	1014790
No. co-national asylum seekers age 26 -35	123,75	342,28	1014790
No. co-national asylum seekers age 36 -65	89,01	244,47	1014790
No. co-national asylum seekers age over 65	4,48	18,37	1014790
Cohort size co-national asylum seekers	360,79	1212,14	1014790
t-1 Cohort size co-national asylum seekers	50,09	209,97	1000680
t-2 Cohort size co-national asylum seekers	10,26	36,33	996988
t-3 Cohort size co-national asylum seekers	4,32	19,03	992520
t-4 Cohort size co-national asylum seekers	2,36	12,88	987075

Source: RDC 2018, own calculations. Notes: Non-labour income is set to zero if no other income sources were reported. Numbers of asylum seekers refer to the number in each county at each year. Cohort lags are calculated based on welfare benefit duration in years up to a maximum of ten years. For those who by construction cannot have a lagged cohort (e.g. with ten years welfare benefit duration) the measure is set to missing.