

Transnational Terrorist Recruitment: Evidence from Daesh Personnel Records*

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July 2019

Abstract

Global terrorist organizations attract radicalized individuals across borders and constitute a threat for both sending and receiving countries. We use unique personnel records from the Islamic State in Iraq and the Levant (Daesh) to show that unemployment in sending countries is causally associated with the number of transnational terrorist recruits from these countries. The relationship is spatially heterogeneous, which is most plausibly attributable to travel costs. We argue that poor labor market opportunities generally push more individuals to join terrorist organizations, but at the same time limit their ability to do so when longer travel distances imply higher migration costs.

JEL classification: F51, E24, E26, Z12

Keywords: transnational terrorism, violent extremism, unemployment, migration costs

*We are grateful to Pierre Bachas, Jishnu Das, Shantayanan Devarajan, Rafael Dix-Carneiro, Hideki Matsunaga, Daniel Lederman, Steven Pennings, Takaaki Sagawa, Jacob Shapiro, five anonymous referees and workshop participants at CSAE, ESOC, LACEA (AL CAPONE), National University of Singapore, NEUDC, the World Bank and the World Congress of the IEA for helpful discussions. We are also grateful to Zaman Al Wasl and Fathi Bayoud for facilitating access to the data on Daesh foreign recruits. Sarur Chaudhary provided excellent research assistance. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of the World Bank, its Board of Executive Directors, or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work.

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1 Introduction

A new wave of terrorism has surged in the past two decades, characterized by transnational attacks and global recruitment, and spearheaded by multinational terror groups such as Al-Qaida and the Islamic State in Iraq and the Levant (Daesh).¹ An unprecedented number of foreign fighters - over 25,000 - travelled to Iraq and Syria between the start of the Syrian Civil War in 2011 and September 2016 to fight for Daesh or for the Al-Nusra Front. These foreign fighters come from a much more diverse set of countries than in previous wars. [United Nations \(2017\)](#) reports that Daesh recruited fighters from over 100 countries. Some of these fighters have engaged in extreme levels of violence in Iraq and Syria, others have perpetrated terrorist attacks in third countries, and those who ultimately return to their home countries are viewed as threats to domestic security ([The Atlantic 2017](#)).

Quantitative evidence on the economic drivers of the recruitment into international terrorist organizations is scarce.² The more extensive literature on domestic terrorism—reviewed in [Gaibulloev and Sandler \(2019\)](#)—does not present conclusive findings about the effect of economic opportunities on terrorism³, and is only partially relevant to the

¹ISIL, a.k.a. ISIS or Daesh, its Arabic acronym.

² A number of case studies have either investigated the ideological motivations of foreign recruits ([Hegghammer 2010](#)), highlighted that a feeling of injustice and lack of economic prospects played a role in the recruitment of foreign fighters from Tunisia ([Zelin 2018](#)) or Central Asia ([Saradzhyan and Duffy 2016](#)), or analyzed the process of radicalization and recruitment at the individual level ([Weggemans et al. 2014](#); [Gates and Podder 2015](#); [Holman 2016](#)). These studies have gathered invaluable qualitative insights into the motivations of foreign fighters through interviews with the fighters and their contacts, yet their data sources do not allow for a quantitative assessment of the drivers of recruitment.

³ See also [Krueger and Malečková \(2003\)](#), [Li and Schaub \(2004\)](#), [Abadie \(2006\)](#), [Krueger \(2007\)](#), [Lai \(2007\)](#), [Krueger and Laitin \(2008\)](#), [Gassebner and Luechinger \(2011\)](#), [Santiford-Jordan and Sandler \(2014\)](#), and [Enders et al. \(2016\)](#). [Berman and Laitin \(2008\)](#) contend that modern religious terrorist groups retain

study of international terrorism. This is highlighted by [Bandyopadhyay and Younas \(2011\)](#) and [Enders and Hoover \(2012\)](#), who observe that domestic and transnational terrorism may respond differently to local economic conditions. In particular, engaging in domestic terrorism can be a part-time occupation and does not require the recruit to travel long distances. By contrast, enlisting as a foreign fighter for an international terror group involves migration costs in addition to forgoing earning opportunities at home and hence constitutes a stronger commitment in light of the difficulty of returning home.

This paper exploits a unique data set of Daesh's personnel records to study how economic opportunities and migration costs shape the spatial pattern of foreign participation in transnational terrorist organizations. The data set contains information on 3,965 foreign recruits from 59 countries, including their age and education. [Dodwell et al. \(2016\)](#) estimate that these data account for approximately 30 percent of the total number of foreign recruits who entered Syria between early 2013 and late 2014. Our main explanatory variable is the unemployment rate in the countries of origin of these foreign recruits.

The individual information contained in the Daesh personnel records allows us to move beyond cross-country correlations and control for any observed and unobserved country characteristics that may affect both terrorism participation and labor market opportunities, such as institutions, government policies, and state capacity ([Fearon and Laitin 2003](#); [Sanchez de la Sierra 2020](#)). Specifically, we link the number of Daesh recruits from a particular country and education group to the unemployment rate faced by workers in that same country and with the same education level. We run panel regressions that include country- and education-level fixed effects so that identification relies on within-country correlations between the schooling gradient of the unemployment rate and the relative number of recruits from each schooling group. Therefore, we contribute plausibly causal estimates of the impact of economic conditions on terrorism participa-

members by limiting their recruits' outside economic opportunities, unlike left-wing or nationalist groups of the past who relied on purely ideological motivation.

tion that are informed by a new data source and a different identification strategy – and arguably weaker identifying assumptions – than in the previous literature.⁴

Theoretically, unemployment has an ambiguous effect on foreign terrorist fighter recruitment. On the one hand, unemployment lowers the economic opportunity cost of participation in terrorist activities and exacerbates grievances against the government (Collier and Hoeffler 2004, 1998; Blattman and Miguel 2010). On the other hand, unemployed individuals may face liquidity constraints that can hamper their ability to travel to the Mashreq region. This mechanism is more relevant in far-away countries where travel costs are higher. Indeed, there is ample evidence that Daesh foreign recruits from different regions paid for their travel to Iraq or Syria (Lemon et al. 2018; FATF 2015; NATO 2016). In its recruitment materials, Daesh specifically emphasized the importance of performing *hijra* (migration), i.e. the need to leave the home country and travel to Daesh territory, as a historical obligation, and the importance to persevere in this undertaking despite financial or security obstacles (NATO 2016).

To disentangle the opposing effects of unemployment on terrorist recruitment, we first consider countries in the neighborhood of Iraq and Syria where the role of travel costs should be minimal. For this sample of close countries, we find that higher unemployment rates push more recruits to join Daesh, with a semi-elasticity of 0.16. Given the total flow of fighters from that area in the period covered by our data, this estimate implies that 1,200 fewer recruits would have joined Daesh during that time if the unemployment rate had been 1 percentage point lower in all countries in the sample.

As more distant countries are added to the analysis, the estimated elasticities drop until they become indistinguishable from zero for countries at a median distance from Iraq

⁴ Krueger and Malečková (2009) propose a related identification strategy to investigate how public opinion of residents in one country towards another country predicts the incidence of terror events perpetrated in the latter country by citizens of the former. Their unit of observation is a country dyad, which makes it possible to control for both sending-country and receiving-country fixed effects.

and Syria. However, among countries furthest away to Iraq and Syria (located more than 2500 miles away), we find that unemployment rates *negatively* affect recruitment to Daesh, with a semi-elasticity of -0.15. We hypothesize that travel costs to Iraq or Syria from such distances are high enough to become a binding constraint for some unemployed individuals wishing to join Daesh.

Whereas we argue for a causal interpretation of the overall impact of unemployment on Daesh recruitment, the source of spatial heterogeneity is not as clearly identified, as distance itself could be correlated with factors that would affect Daesh recruitment. In the absence of a credible instrument for geographic distance, we show that the distance-unemployment interaction in our regression dominates competing interactions between unemployment and GDP per capita, the share of the Muslim population, regional dummies, fractionalization of different types, political variables (polity score, political rights etc), and social and government regulation of religion.⁵ We conclude that migration costs between countries of origin and the headquarters of the terrorist organization is a credible reason why the effect of unemployment on recruitment declines with distance and eventually changes sign.

Our paper contributes to several strands of literature. First and foremost, our work adds to the emerging scholarship on the economic drivers of transnational terrorism. In addition to [Bandyopadhyay and Younas \(2011\)](#) and [Enders and Hoover \(2012\)](#) mentioned earlier, our paper is closely related to [Verwimp \(2016\)](#) and [Benmelech and Klor \(2018\)](#). [Benmelech and Klor \(2018\)](#) ask a question similar to ours, but use a country-level measure of terrorist recruitment, estimated from a variety of sources such as social media or

⁵ Our results also hold within sub-samples constituted of Muslim-majority or Muslim-minority countries; when controlling for average wages; with alternative estimators such as the Poisson Pseudo Maximum Likelihood estimator; and with alternative distance measures. We also use data on domestic terrorism across the world to show that the availability of domestic terrorism opportunities is unlikely to explain our results.

investigations. Therefore, their results rely on a different source of data and on cross-country, rather than within-country, variation. We nonetheless replicate their results by aggregating our individual records by country as a data check exercise. The study by [Verwimp \(2016\)](#) emphasizes the difference in labor market outcomes between EU natives and non-EU immigrants and finds that larger gaps are associated with higher numbers of foreign fighters. As in [Benmelech and Klor \(2018\)](#), the analysis relies on cross-country variations, which makes it vulnerable to country-level confounders, unlike our fixed-effects estimates. Admittedly, our measure of labor market opportunities is not specific to the Muslim or non-native population as in [Verwimp \(2016\)](#), but we conduct a large number of robustness checks in section 4.3 to ensure that this is not driving our results. In particular, running our regressions within subsamples of muslim-majority and muslim-minority countries yields similar results.

The spatially heterogeneous relationship between local socio-economic conditions and the transnational recruitment of terrorists that we uncover mirrors findings in the international migration literature that emphasize the non-monotonic relationship between economic development and migration ([Clemens 2014](#)). Our result on geographically close countries — that economic opportunities at home reduce participation in terrorism — is consistent with the literature on micro-economic drivers of violent conflict ([Verwimp et al. 2018](#)); similar findings emerged in many different local contexts and for various forms of violence. For instance, the violence-dampening effect of improved labor market opportunities has been found among youths susceptible to crime in Chicago ([Davis and Heller 2019](#)), Liberian ex-combatants ([Blattman and Annan 2010](#)), Indian villagers affected by the Maoist rebellion ([Fetzer 2019](#); [Dasgupta et al. 2017](#)), or insurgents in Afghanistan, Iraq, or Pakistan ([Guardado and Pennings 2019](#)).⁶

⁶[Berman et al. \(2011b\)](#) on the other hand find a *negative* relationship between unemployment and localized violence in Afghanistan, Iraq and the Philippines. They suggest that local unemployment can affect conflict by changing civilians' incentives to side with the government in its fight against insurgencies. In

The rest of the paper is organized as follows. In section 2, we describe the data sources used in the paper and provide evidence that the personnel records on Daesh recruits are consistent with the existing information used in the literature. Section 3 discusses our empirical strategy. Section 4 examines the effect of unemployment on Daesh recruitment, the spatial heterogeneity of the unemployment-recruitment relationship, and presents a battery of robustness tests. Section 5 concludes.

2 Data Sources

The analysis conducted in this paper combines personnel records on Daesh foreign recruits and socio-economic information about the countries of residence of these individuals before they joined the terrorist group.

2.1 Daesh personnel records

Daesh personnel records were obtained by a number of news organizations including Syria's Zaman al Wasl (who in turn shared the data with the World Bank), Germany's Süddeutsche Zeitung, Westdeutscher Rundfunk, and Norddeutscher Rundfunk, Britain's Sky News, and NBC News in the U.S.. These news organizations described a Daesh defector as their source for the documents. Our data are identical to the ones described in [Dodwell et al. \(2016\)](#), who provide a detailed description of their origin and were able to corroborate 98% of the records with data maintained by the U.S. Department of Defense.

The data set contains information on 3,965 foreign recruits from 59 countries. The information is on foreign recruits who joined the ranks of the terrorist group *in* Iraq and Syria rather than on individuals who remained in their home country and pledged alle-

particular, the authors argue that higher unemployment rates could lower violence by lowering the government's cost of buying information about insurgents from civilians. This mechanism is less relevant in the context of trans-border terrorism, where recruits travel to join the terrorist organization in another country.

giance to the organization. The records include information on the recruits' country of residence, citizenship, education, age and marital status. Table 1 provides a breakdown of records by country of last residence. [Dodwell et al. \(2016\)](#) estimate that these data account for approximately 30 percent of the total number of foreign recruits who entered Syria between early 2013 and late 2014. All individuals in our sample are male, although the terrorist group is known to have also recruited females ([Windsor 2018](#)).

Although the nature of the sample selection cannot be precisely established, the distribution of countries of origin – our main outcome variable – is highly consistent with the existing publicly available information, which [Benmelech and Klor \(2018\)](#) use.⁷ Figure 1 shows a high correlation between our personnel records and their estimates, with a slope of 0.78 in the full sample and a slope of 0.99 when we drop one outlier (South Africa). Half of the variation in our data is absorbed by variation in their estimates; most data points are closely aligned with the predicted values from a linear regression. As an additional data check, we reproduce [Benmelech and Klor \(2018\)](#)'s estimations of the country-level determinants of Daesh recruitment in Tables A2 and A3. Table A2 uses a dummy outcome indicating if any recruit is coming from a given country, and Table A3 uses the log of one plus the number of recruits, as in [Benmelech and Klor \(2018\)](#). In both tables, we use our personnel records to construct the outcome variable in columns 1-4 and the expert estimates from [Benmelech and Klor \(2018\)](#) in columns 5-8. We find that the predictors for Daesh recruitment are similar in both data sets; these comparisons fail to reveal a bias in our data one way or the other.

In contrast to previous studies on terrorism (see e.g. [Abadie 2006](#) and [Benmelech and Klor 2018](#)) or on civil conflicts generally speaking (see survey from [Blattman and Miguel 2010](#)), we have detailed and plausibly representative individual information on terrorist

⁷Their data were published in two reports by the Soufan Group, a strategic security intelligence think tank. They gather official and unofficial counts of the stock of foreign fighters from each country obtained from social media, community sources, or investigations, as of June 2014.

recruits, which allows us to draw inference from sub-national variation. Specifically, in the Daesh personnel records, individuals report having either no education or primary, high school or university level education. We can thus construct recruitment statistics by country of residence and level of education, distinguishing primary education and below, secondary, and tertiary. After removing observations without either country of residence or education, we are left with a sample of 2,987 recruits originating from 59 countries.⁸

Daesh recruits the majority of its fighters from nearby Muslim countries. Table 1 organizes the sample of Daesh recruits by country of last residence, ranking the countries by geographical distance. The first 10 countries in the list account for almost 45 percent of Daesh's foreign recruits in our data set. Despite a few more distant large providers such as Tunisia, Morocco, or France, recruitment in a country declines with distance, both at the extensive and the intensive margins, after controlling for total and muslim populations (Tables A2 and A3, columns (1) and (2)). This suggests *prima facie* that migration costs associated with distance may be an obstacle to recruitment by Daesh.

Two-third of the recruits are in their twenties (Table 2). In addition, we find that 33.7 percent of the sample is married and 22.1 percent of the recruits have children. Our data also contain characteristics that reflect a recruit's human capital and indicate that 51.7 percent of the recruits report having a secondary education and 30.6 percent report having a tertiary education.

Figure 2 compares the fraction of primary, secondary and tertiary educated recruits in our sample with the proportions observed in the labor force of their country of last residence. In order to obtain stable proportions, we restrict the figure to countries represented by at least ten recruits. A large majority of blue squares and green triangles are above the forty-five degree line, meaning that Daesh recruits are more likely to have a secondary or tertiary education than the average worker in their country of last residence. Conversely, there are fewer recruits that have only a primary education or less, relative to

⁸We do not include the 32 recruits from Iraq and 43 from Syria.

the labor force in their country of last residence. These findings reinforce the conclusions of [Krueger and Malečková \(2003\)](#), and later [Abadie \(2006\)](#), [Krueger \(2007\)](#) and [Krueger and Laitin \(2008\)](#) who argued that terrorist recruits are not uneducated, and often come from middle-class backgrounds or have some college education.

Another original feature of the data is that they contain information on self-reported knowledge of Sharia, which is available for almost 90 percent of our observations and is recorded as low, intermediate, or high. A large majority of recruits are too ignorant of Islam to be accurately described as religious fundamentalists; only about a third of recruits report an intermediate or high level of knowledge (Table 2). This observation is consistent with the view held in the literature that religious terrorism is less driven by ideology than it is by kinship and social networks (see discussion in [Gaibulloev and Sandler 2019](#)).

2.2 Macroeconomic indicators

We combine Daesh personnel information with country-level economic data, also disaggregated by education levels. We use ILOSTAT data to construct education-level-specific unemployment rates for most countries, yielding 177 country*education-level observations. We use data from 2013 to best match the personnel records on Daesh foreign recruits. If data from 2013 are missing, we use the nearest available year.⁹

To construct wage data, we use the International Income Distribution Data Set (I2D2) to compute median wage by education level for each country. The data set is a global harmonized household survey database compiling data from household surveys and labor force surveys ([Montenegro and Hirn 2009](#)). As for the unemployment variable, we take median wage data for the year 2013 and replace the missing values with the closest lead

⁹To maximize the number of observations, we use the total unemployment rate in our main results, but obtain qualitatively similar results when using the male unemployment rate or the youth unemployment rate.

or lag during 2010-2016. Since we will be computing relative wages, we do not attempt to deflate or convert the nominal wage information. When we include the wage, unemployment and education variables together, we are left with only 28 country*education-level observations from 12 countries. For robustness, we also use a second version of the wage variable, specific to the male population between 18 and 36 years.¹⁰

Augmenting the data with observations from 109 countries that do not supply Daesh recruits leads to a final dataset that consists of 168 countries or 504 country*education observations. Table 3 describes the country-level variables we use (total population, Muslim population, per capita GDP, Human Development Index, political freedom measures, corruption index, religion variables and distance to Iraq and Syria) as well as the country-by-education-level variables (unemployment and wage rates). Detailed variable definitions and their sources are provided in Table A1.

3 Empirical strategy

Our empirical approach incorporates two main ingredients. First, we leverage our detailed individual data on Daesh recruits and propose an identification strategy that improves on the existing cross-country analyses of the economic drivers of terrorism. Sec-

¹⁰One limitation is due to recent unemployment and wage rate information not being available for all countries. Table A18 shows the countries for which we have these data, and countries that supply Daesh recruits. Given the lack of sufficient overlap between the unemployment and wage variables, we henceforth proceed in two steps. First, we conduct our analyses using the unemployment variable only, hence omitting the wage variable. If wages and unemployment are uncorrelated, this approach is innocuous. We indeed find that the residuals of unemployment and wages, after partialling out country and education fixed effects, are uncorrelated, as illustrated in Figure A3. We nonetheless verify in section 4.3 that our results are robust to controlling for wages using the smaller sample of countries where we have both wages and unemployment data by education categories.

ond, we exploit variation in the distance travelled by Daesh fighters to join the terror group in Iraq or Syria to provide empirical support for an economic mechanism specific to transnational terrorist recruitment.

To control for unobserved country-level confounders that plagued the earlier literature on the macroeconomic determinants of terrorism, we exploit the unique features of our data – namely the availability of the number of Daesh recruits and the unemployment rate for each country and education category (primary, tertiary and secondary education). This allows us to implement an identification strategy that leverages within-country variation across education groups, hence isolating the causal impact of unemployment on transnational terrorism under weaker conditions than in the previous literature. Specifically, we estimate

$$N_{ce} = \alpha + \mu_c + \gamma_e + \beta \cdot Unemp_{ce} + \xi \cdot X_{ce} + \epsilon_{ce}, \quad (1)$$

where the outcome is the number (or log number) of Daesh recruits from country c with education level e , μ_c and γ_e represent fixed effects for each country and the three education-level categories; β captures the conditional association of the unemployment rate specific to a country-education cell with the number of Daesh recruits¹¹; and ϵ_{ce} is an error term. We control for the size of the labor force in the country-education cell, X_{ce} . In additional robustness checks, we will also control for the average wage in each country-education cell. The inclusion of country fixed effects allows us to control for any country-level characteristics affecting individuals' propensity to join Daesh, such as those related to distance to Iraq and Syria, state capacity, institutions and political representation, as long as the effect of these country-level characteristics on Daesh participation is constant across the three education-level categories. The constant α meanwhile absorbs

¹¹To the extent that psychological and political grievances co-vary with the unemployment rate across education categories, their effect would also be captured by β .

the mean returns to engaging in violence.

We observe that the theoretical prediction about the impact of unemployment on participation in transnational terrorism is ambiguous. On the one hand, unemployment lowers the economic opportunity cost of participation in terrorist activities and might also generate or exacerbate grievances against the government. Both predict a positive relationship between unemployment and Daesh enrollment. For simplicity, we refer to this mechanism as the opportunity-cost channel. On the other hand, unemployment can be an obstacle to participation in a transnational terrorist organization, if joining the latter is economically costly and unemployment exacerbates liquidity constraints. The trip to join Daesh indeed constitutes a non-trivial cost (plane ticket, visa, potentially hotel and bus tickets), which most recruits fund out of pocket, with little to no financial support from the organization. The cost of joining the terrorist group is analogous to the cost of migration considered in the labor and migration literature ([World Bank 2018](#)), but has not previously been considered in the conflict literature. We henceforth refer to this mechanism through which unemployment may be negatively affect participation in transnational terrorism as the liquidity-constraint channel.¹²

The liquidity-constraint channel should be stronger for potential recruits from countries far away from Iraq and Syria, for whom the travel costs are highest. Thus, to distinguish the liquidity-constraints channel from the opportunity-cost channel, we estimate

¹²Previous studies have highlighted other mechanisms which may offset the positive effect of unemployment on participation in terrorism. Most importantly, [Berman et al. \(2011a\)](#) find that higher wages are associated with *more* rather than *less* violence in Iraq, which is consistent with a community-centric model of participation in violence, whereby higher wages make it harder for the government to financially incentivize communities to participate in counter-insurgency efforts. However, this channel does not apply to our context of transnational recruitment.

the extended model

$$N_{ce} = \alpha + \mu_c + \gamma_e + \beta \cdot Unemp_{ce} + \delta \cdot Unemp_{ce} \cdot Distance_c + \xi \cdot X_{ce} + \epsilon_{ce}, \quad (2)$$

where $Distance_c$ is the shortest distance in miles from country c to the nearest border point of Iraq or Syria. The liquidity-constraint mechanisms would suggest that the coefficient δ on the interaction term between distance and unemployment is negative. The relative size of δ compared to β measures the importance of the attenuating effect of liquidity constraints to cover travel costs on the role of unemployment as a driver to joining Daesh.

The liquidity-constraint channel will be weaker, potentially even absent, in countries at a low geographic distance to Daesh headquarters. Thus, we start our empirical analysis in section 4.1 with a specification of equation 1 restricted to countries that are “close” to Iraq and Syria. This approach minimizes the liquidity constraint channel, allowing us to estimate the effect of higher unemployment on terrorist supply which operates through a lower opportunity cost of joining Daesh and through increased grievances. In section 4.2, we broaden our analysis to all countries with Daesh recruits, and estimate equation 2 to see how the effect of unemployment changes with distance, providing direct evidence on the liquidity-constraint channel. We carefully consider potential confounders to confirm that the distance interaction indeed captures the strength of the liquidity constraints mechanism rather than other factors correlated with distance. In section 4.3, we present a battery of robustness tests.

4 Results

4.1 Unemployment and the Opportunity Cost of Joining Daesh

The opportunity-cost channel described in the previous section predicts a positive correlation between unemployment and Daesh recruitment. To test this, we must shut down the liquidity-constraint channel. We start by estimating equation 1 in the sample of countries within 500 miles of the nearest border point of Iraq or Syria. This includes immediate neighbors in the Middle East, countries in the Gulf and North Africa, as well as some countries in Central Asia (see Table 1 for the list of countries ranked by distance to Syria).

The regression results are displayed in Table 4 and show a positive effect of unemployment on Daesh enrollment in geographically close countries. The unconditional correlation between unemployment and the (log) number of Daesh recruits is positive, with a point estimate of 0.061.¹³ In column 2, we add dummies for the three education categories and in column 3 we add country fixed effects, to absorb any country-level factors that do not vary across education groups. The inclusion of these fixed effects doubles the size of the point estimate and strengthens its significance. It suggests that the country-level unobservables were biasing estimates downward. In column 4, we additionally control for the size of the labor force so that the main coefficient can be interpreted as a propensity of joining Daesh. This leads to a slight reduction in the sample size and to a further increase in the point estimate to 0.147.

A semi-elasticity of 0.147 implies that a 1 percentage point reduction in the unemployment rate leads to a 15.8 percent reduction in Daesh enrollment. [Dodwell et al. \(2016\)](#) esti-

¹³Since the left-hand side of the equation is the logarithm of the number of Daesh recruits, it is only defined when such number is strictly positive. Cells that do not have at least one foreign recruit are dropped from the regression. However, in our sample of close countries, almost all of the 36 country-education cells register fighters, leaving us with a sample of 34 observations. We apply Moulton's parametric correction to re-compute the standard errors in all regressions where cluster size is less than 40 ([Moulton 1986](#)).

mate that the total number of foreign recruits arriving during our sample period is about 15,000, and our data indicate that around 50 percent of that flow stems from the sample of close countries, as defined here. Therefore, our result suggests that around 1200 fewer fighters would have joined Daesh from these countries over the period 2013-2014, if the unemployment rate had been 1 percentage point lower in these countries.¹⁴

In column 5 of Table 4, we extend our definition of “close” countries by including countries at below median distance from Iraq and Syria. This increases the sample from 12 to 21 countries. The positive association between unemployment and Daesh recruitment is still present in this sample, but the point estimate is now half the size compared to column 4. This suggests that the effect of unemployment on Daesh recruitment is weaker in more distant countries, a result consistent with a liquidity-constraint channel working in the opposite direction. We examine the spatial heterogeneity in the unemployment effect in more detail in section 4.2.

4.2 Spatial Heterogeneity in the Relationship Between Unemployment and Daesh Recruitment

For countries close to Iraq and Syria, unemployment is found to increase enrollment in Daesh. For potential recruits from countries that are further away, however, the travel cost to Mashreq countries is higher, meaning that liquidity constraints may become binding for poorer or unemployed candidates. Therefore, the effect of unemployment on Daesh enrollment should decrease as distance to Iraq and Syria increases.

To test this hypothesis, we estimate the extended regression model in equation 2. In this model, the interaction term between unemployment and distance can be a continuous interaction or an interaction with country group dummies based on the distance median, terciles or quartiles across countries. We show results for all specifications, but note that

¹⁴The average unemployment rate in that set of countries is 9.6 percent.

the quartiles-specification is our preferred option, as it is most flexible, allowing the effect of unemployment to be non-linear in distance.

The regression results are presented in Table 5 and illustrated in Figure A1. In the first column, we use the continuous distance interaction, showing that the migration costs indeed attenuate the effect of unemployment on recruitment. In columns 2-4, we repeat this estimation, interacting unemployment with distance median-groups, terciles or quartiles respectively. The results are robust across specifications: the effect of unemployment on recruitment is positive in close countries, then decreases with distance, and becomes negative in distant countries where the liquidity-constraint mechanism dominates. The quartile interactions in column 4 confirm that the positive effect of unemployment is concentrated in the first quartile and the negative effect is concentrated in fourth distance quartile. In the second and third distance quartile, the effect of the opportunity and grievance mechanism is exactly nullified by the liquidity constraints mechanism, so that the association between unemployment and recruitment becomes insignificant.¹⁵

Figure 3 graphically illustrates the identification for the quartiles specification. The different panels plot the residualized unemployment rate and log number of Daesh foreign fighters, after partialling out country and education-group fixed effects. Among countries in the first distance quartile, which is similar to our initial sample of countries at below 500 miles distance (minus Ukraine), the resulting slope is positive and significant as discussed earlier. In the fourth distance quartile group, the slope is now *negative* and significant, while it is insignificant in the second and third quartile subsamples. Besides, as Figure 3 makes clear, the slopes we obtain are informed both by cross-country variation within a schooling level and cross-education-group variation within a country. Each one of three education-level-specific clouds of points (triangles, squares and circles) line up individually to create a slope. Similarly, the within-country variation identifies a similar slope, as can be seen by looking at the alignment of the three points for specific

¹⁵ Bootstrapped standard errors yield similar results (Table A4).

countries such as Egypt and Saudi Arabia in Panel A.

Finally, we show that our main result holds within groups of fighters with the same desired occupation within Daesh — fighter, suicide fighter, or administrator. Conceptually, the outside option now includes staying in the home country or joining Daesh in a different role. Columns 5-7 in Table 5 report the results of our main regression specification applied separately to the contingents of fighters, suicide fighters and administrators. The levels of significance differ (primarily because the standard errors are increased due to the smaller sample size), but the coefficient patterns obtained for the whole sample largely carry through for each separate role. The main effect of unemployment is positive, the interaction with distance is negative, and both coefficients are of the same order of magnitudes (or bigger) for the three roles compared to the whole sample. For fighters, the effect of unemployment is relatively lower than for the other categories, while it is higher for suicide fighters.

4.2.1 Analysis of Distance Confounders

We argue that the overall impact of unemployment on Daesh recruitment is causally identified through quasi-random variation in unemployment rates, holding country-level and education-level factors fixed, but we acknowledge that our spatial heterogeneity result could be driven by any factor that systematically varies with distance. In the absence of a credible instrument for travel costs applicable to our data, this section presents evidence to rule out a large set of competing stories.

Geographically more distant countries, such as OECD countries, may have stronger social welfare systems, so that unemployment does not necessarily generate social and economic exclusion to the point of driving Daesh participation. More distant countries are also less likely to be Muslim-majority countries, and hence less relevant or costlier as a pool for Daesh recruiters. Geographical distance might also capture some more general form of cultural distance, implying non-monetary costs that would not interact with

unemployment through credit constraints. Finally, there are very few individuals with only primary education in OECD countries, such that the unemployment rate for this education category is measured more imprecisely there.

A general argument against the alternative stories above is that they can produce an attenuated or zero effect of unemployment in more distant countries, but not the negative effect that arises in the farthest quartile of countries.

We can also rule out a number of specific distance confounders. In Tables 6 and 7, we conduct a horse race between distance and four alternative variables correlated with distance: GDP per capita, the fraction of Muslims in a country's population, and dummies for the MENA region and the OECD. That is, we interact these alternative variables with the unemployment rate, and test them individually or jointly against the interaction with distance. Only the OECD interaction and Muslim-fraction interaction are marginally significant when used individually (column 3 in both tables), but lose significance once the distance interaction is added (columns 6 and 7). The physical distance interaction thus trumps all other interactions, and is the driving force for our main effect.

We also conduct a systematic analysis with other potential confounders which can be correlated with distance. In Tables A5-A9, we run the 'horse race' between the distance interaction and interactions with ethnic and linguistic fractionalization, religious and government fractionalization, political and institutional variables (political rights, corruption, the polity index, polity fragmentation), and social and government regulation of religion. Our results are clearly robust to all interactions. The distance interaction remains consistently significant and large, trumps all other interactions, and hardly any of the other interactions with unemployment are significant.

In addition, we show in Table A10 regressions in which we interact unemployment with each region dummy individually, and a fully saturated model with all unemployment*region interactions. There is no region where unemployment has a significant effect, emphasizing again that the relevant driver of the interaction is physical distance rather

than institutional characteristics of a country or region. Indeed, each region is spread across various of the distance quartiles.

4.2.2 Substitution between Domestic Terrorism and International Jihad

An alternative to international jihad is domestic terrorism, which might provide similar ideological benefits to radicalized individuals without requiring a migration cost (Hegghammer 2013). Indeed, substitution across various types of terrorism is not uncommon, as Enders and Sandler (2004) show in their analysis of substitution between attack types, countries and over time.

In this section we consider whether the geographical distribution of domestic terrorist opportunities could be an alternative explanation of the negative interaction between distance and unemployment. If radicalized individuals in more distant countries substituted joining Daesh with domestic terrorism, the occurrence of local terrorist events should have increased more in distant countries relative to less distant countries, in the period in which Daesh was recruiting. The substitution effect should be particularly strong in countries with high rates of unemployment. We test this by estimating the following triple-difference model:

$$\begin{aligned} \ln(T_{ct}) = & \alpha + \mu_c + \rho_t + \beta_1 \cdot Unemp_{ct} \\ & + \beta_2 \cdot Distant_c \cdot Post_t + \beta_3 \cdot Distant_c \cdot Unemp_{ct} + \beta_4 \cdot Post_t \cdot Unemp_{ct} \\ & + \beta_5 \cdot Post_t \cdot Unemp_{ct} \cdot Distant_c + \epsilon_{ct}, \end{aligned}$$

where T_{ct} is the number of terrorist events per country and year from the [Global Terrorism Database](#), $Distant_c$ indicates countries in the fourth distance quartile (the remaining countries are in the second and third distance quartile, as the first quartile is affected by more direct spillovers from Daesh and hence dropped), μ_c and ρ_t are country and year fixed effects, $Post$ indicates the years after Daesh emergence, and the unemployment rate

is measured at the country-year level.¹⁶ We control for year and country fixed effects. As the outcome data is at the country level, we cannot run our main specification with education-group disaggregation.

Table A11 displays the results. We find that there was indeed an increase in terrorist events in distant countries after Daesh emerged, and the likelihood of a terrorist incident is generally higher in distant countries with high levels of unemployment. However, the coefficient on the triple interaction is always insignificant, suggesting there is no evidence for substitution from Daesh to local terrorism. The results change little when we vary how the Daesh-time indicator *Post* is measured as shown in the different columns, or when using a dummy indicating any terrorist event as outcome. In addition, we show in Table A12 that our main results from the model with country and education-group fixed effects are unchanged when controlling for additional interactions between unemployment, distance and domestic terrorism. The coefficients on these additional interactions are not statistically significant. We thus fail to detect any evidence of a substitution between domestic and transnational terrorism.

4.3 Robustness Tests

We now conduct a series of robustness tests to confirm that both the effect of unemployment on Daesh recruitment and its spatial heterogeneity hold under various alternative specifications, refuting a broad array of potential concerns with the empirical strategy.

4.3.1 Muslim-majority vs. Muslim-minority countries

We begin by refuting concerns related to the fact that our unemployment variable is not measured among Muslims only. Under the assumptions that Muslims constitute the pool of potential Daesh recruits, and that Muslims face different unemployment rates

¹⁶ These spillovers are also the reason we cannot test for a negative substitution effect on local terrorism in countries close to Iraq and Syria.

than non-Muslims, unemployment rates would be mis-measured in countries with large non-Muslim populations. Depending on the correlation between between Muslim and non-Muslim unemployment rates, and how it varies with distance, the mis-measurement could lead to a falsely significant coefficient or the wrong sign.

We provide three pieces of evidence against these concerns. First, figure [A2](#), Panel A, shows that the Muslim unemployment rate (as measured by Gallup survey data) is strongly correlated with the general unemployment rate.¹⁷ Given this positive correlation, the negative effect of unemployment in the fourth distance quartile is *prima facie* evidence against the measurement error hypothesis, as classical measurement error would bias the coefficient to zero.

In addition, in Table [A13](#), we rerun our main estimation, with the continuous distance interaction and the quartile interaction, after dropping countries with a more than 40% (more than 20%) deviation between the Muslim male unemployment rate and the general male unemployment rate (columns 3-4 and columns 5-6 respectively). The results are highly robust to this sample modification. This is consistent with the fact that the deviation between Muslim male and general male unemployment does not systematically vary with distance, as shown in Figure [A2](#), Panel B.

Third, and crucially, our results are not driven exclusively by Muslim-majority countries, as we demonstrate in Table [8](#). Columns 4 and 5 in this table split the sample by whether Muslims constitute more or less than 50% of the population. As this leads to a slightly unequal split of the sample, we repeat the exercise in columns 6 and 7 by splitting the sample exactly at the median of the Muslim population share. In all subsamples, the coefficients on unemployment and the unemployment*distance interaction are remarkably similar, and the standard errors suggest that we cannot reject the null hypothesis that the coefficients in all specifications are identical.¹⁸ In Tables [A14](#) and [A15](#),

¹⁷Unfortunately, the Gallup measure cannot be used dis-aggregated at the education-category level.

¹⁸A similar result holds if we instead restrict to countries such that Muslims account for at least 1 percent

we provide additional evidence on this, allowing for interactions between unemployment (or unemployment*distance) and dummies indicating Muslim majority countries (or an above-median share of Muslim, or MENA or OECD regional dummies). Our main results are unchanged in these specifications and none of the interaction terms between Muslim majority and unemployment or unemployment*distance are significant.¹⁹ This robustness check addresses not only the concern about measurement error in the unemployment rate, but also the more general point that the supply function of Daesh recruits could be different between Muslim-majority and minority countries.

4.3.2 Leave-one-out test

Next we show that our main results are not driven by one or two influential countries. To show this, we estimate our preferred specification (Table 5, column 4) forty-four (44) times, each time leaving out one country. Figure 4 displays the distribution of point estimates from this exercise. The distribution is clearly concentrated around the main effect we estimate in the full sample, and has short tails. Figure 5 shows results for a similar exercise, in which we drop two countries from our sample in each iteration.

4.3.3 Poisson Specification

While we have so far used a log-linear OLS estimation with the log of the number of Daesh recruits (from a given country with a given education level) as the outcome variable, Table A16 shows that the results are very similar when estimating a Pseudo Poisson Maximum Likelihood (PPML) model according to Santos Silva and Tenreyro (2006) with the number of Daesh recruits as outcome. This model has the advantage of utilizing all

of their entire population. There are 41 such countries in our sample.

¹⁹This also confirms that the effects of unemployment and unemployment*distance are not significantly different between Muslim majority and Muslim minorities countries, although the sub-sample regressions in Table 8 show the coefficients being statistically significant in one sub-sample but not in the other.

observations from countries with any recruits, whereas the log-linear model uses only country-education cells with any recruits. The PPML thus increases the sample from 105 to 132 observations.

4.3.4 Including wage levels

Conceptually, the labor market opportunity cost of joining Daesh is composed not only of the probability of being unemployed, but also of the wage level available at home to potential recruits. Our main specification does not include wages as a regressor, because schooling-specific wage data are available only for a small subset of the countries producing Daesh fighters. Therefore wages are part of the regression's error term. If wages are correlated with unemployment ([Blanchflower and Oswald 1994](#)), the coefficient on unemployment should be interpreted as the effects of labor market opportunities at home broadly construed, including both unemployment and wages. Note, however, that our specification includes country and education fixed effects. Therefore, the coefficient on unemployment will be affected by the omission of wages only if these two variables are still correlated after partialling out country and education fixed effects. [Figure A3](#) shows this is not the case for the subset of 28 observations in 12 countries for which schooling-specific wage levels and unemployment rates are available and that register at least one Daesh recruit.

Using that subset of observations, we further verify in [Table 9](#) that our results are not driven by wages rather than unemployment. To maximize power in this smaller sample, we focus on the specification that includes a continuous interaction between unemployment and distance. The results for that specification estimated on the full sample are reproduced for comparison purposes in column 1, [Table 9](#). In column 2, we add the logarithm of the median wage in each country and education level as an additional regressor. The coefficient on the wage variable itself is not significant, and the impact of unemployment on Daesh enrollment remains qualitatively and quantitatively similar. If the stan-

dard errors in column 2 were comparable to those in column 1, the point estimate of the coefficient on unemployment would be statistically significant. This shows that the difference in statistical significance between columns 1 and 2 are due to changes in sample size. Indeed, removing the wage regressor but keeping the restricted sample yields estimates comparable to column 2 (see column 3). In column 4, we use an alternative wage variable that takes the median value of wages for males aged 18-36, which is the appropriate comparison group for Daesh foreign recruits. Here again, the coefficients on unemployment and its interaction with distance remain consistent with our main specification in column 1.

4.3.5 Censoring at 0

Next, we address the concern that our main specification sample is mechanically censored at 0 recruits in a given country-education cell. First, note that a censoring rule based on the total number of fighters from a given country would not be problematic, since the expectation of the error term conditional on that rule would be absorbed in the fixed effects. Using this insight, we find the lowest country-level threshold such that all countries with a number of recruits equal to or above the threshold have recruits in all three education categories. This happens for countries with more than 33 fighters. The result, displayed in column 1 of Table 8, is similar to our main result despite the fact that this restriction lowers the number of countries under consideration to 12 and the total number of observations to 36.

Furthermore, columns 2 and 3 show that results are robust to varying either the country-level cutoff or the country-education-level cutoff away from 0. Column 2 uses countries that have at least ten Daesh recruits. This increases the sample to 28 countries. In column 3, we instead consider all countries that have at least one recruit in each of the three education levels being considered, even if they have less than 33 fighters overall. This selection leads to a regression based on 25 countries. Besides these results, the Poisson

regressions in Table A16 are also robust to censoring concerns, as the Poisson uses all country-education cells in countries with at least one fighter.

4.3.6 Alternative distance measures

Lastly, we show in Table A17, that our results are highly robust to different distance measures. Indeed, the coefficients on our regressors of interest are very stable, whether we measure distance from a country's most populous city, or the capital city, or geographic centre, and whether we consider distance to Iraq or to Syria.²⁰

5 Conclusion

We used a unique data set on Daesh personnel records to shed light on the determinants of transnational terrorist recruitment. We document the impact of higher unemployment rates on enrollment in the terror group. Exploiting detailed information on foreign recruits' countries of origin and education levels, we are able to establish this finding under weaker identification assumptions than those previously used in the literature. More specific to the question of transnational terrorism, we show that travel costs to Iraq and Syria, which exacerbate liquidity constraints of unemployed candidates, negatively affect enrollment. The tension between opportunity costs and liquidity constraints is novel to the literature on terrorism and applies not only to Daesh but to transnational terrorist recruitment more generally: limited labor market opportunities simultaneously have a *substitution* effect by lowering the opportunity costs of joining the terror group and an *income* effect, which exacerbates liquidity constraints for candidates who need to travel

²⁰We prefer these geographic measures to alternative distance measures such as the cost of a flight ticket, as measuring the latter would require more choices to be made by the researcher, such as the time of the year at which to measure the cost, or how to average across seasonally changing prices. Besides, it is clear that flight costs are strongly correlated with distance.

long distances to join. This gives rise to spatially heterogeneous effects of economic conditions on recruitment. This result is relevant beyond counter-terrorism policy — see e.g. [Clemens and Postel \(2018\)](#) on the relation between foreign aid and migration— and has implications for the design of interventions to limit transnational terrorist recruitment: policies that improve socio-economic outcomes have income and substitution effects that can go in opposite directions.

6 Tables

Table 1: Daesh Recruits by Country of Last Residence

| Country | Region | Fighters (#) | Fighters per million Muslims | Distance to Syria (miles) | Per- capita GDP (USD) | Labor Force (millions) | Muslim Proportion (%) |
|--------------|------------|-----------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|-----------------------------|
| Mean | All | 58.3 | 13.1 | 2,081.4 | 21,083.9 | 37.9 | 51.7 |
| St. Dev. | All | 128.5 | 16.4 | 1,615.5 | 26,021.3 | 121.6 | 43.1 |
| Palestine | MENA | 21 | 4.9 | 174.7 | 2,992.2 | 1.0 | 97.5 |
| Lebanon | MENA | 14 | 5.5 | 190.7 | 8,389 | 1.9 | 59.7 |
| Iraq | MENA | 32 | 1 | 289.8 | 6,816.6 | 8.5 | 98.9 |
| Jordan | MENA | 56 | 8.8 | 332.9 | 4,656.2 | 1.9 | 93.8 |
| Turkey | MENA | 209 | 2.8 | 354.9 | 10,800.4 | 27.8 | 98.6 |
| Georgia | Fmr Soviet | 3 | 6.8 | 573.2 | 4,274.4 | 2.0 | 10.5 |
| Azerbaijan | Fmr Soviet | 92 | 10.5 | 598.1 | 7,811.6 | 4.9 | 98.4 |
| Kuwait | MENA | 34 | 12.9 | 625.4 | 48,463.2 | 1.9 | 86.4 |
| Egypt | MENA | 203 | 2.5 | 735.5 | 3,264.4 | 29 | 94.7 |
| Saudi Arabia | MENA | 731 | 28.7 | 838.9 | 24,646 | 11.8 | 97.1 |
| Iran | MENA | 13 | .2 | 861.2 | 6,631.3 | 26.6 | 99.7 |
| Bulgaria | Europe | 1 | 1.7 | 910.2 | 7,656.6 | 3.3 | 78 |
| Bahrain | MENA | 24 | 27.7 | 915.5 | 24,378.9 | 0.7 | 70.2 |
| Qatar | MENA | 9 | 7.7 | 977.9 | 96,077 | 1.6 | 77.5 |
| Ukraine | Fmr Soviet | 3 | 7.6 | 1,021.5 | 3,986.3 | 23.1 | .8 |
| Macedonia | Europe | 16 | 32 | 1,046.6 | 5,219.5 | 0.9 | 33.3 |
| Kosovo | Europe | 36 | 22.7 | 1,112.5 | 3,890.3 | . | 95.6 |
| Albania | Europe | 9 | 4.8 | 1,113.7 | 4,412.3 | 1.3 | 58.79 |
| Serbia | Europe | 1 | 4.4 | 1,149.6 | 6,353.8 | 3.1 | 2.8 |
| Turkmenistan | Fmr Soviet | 5 | 1 | 1,170.6 | 7,480.3 | 2.3 | 93.3 |
| Bosnia | Europe | 4 | 2.2 | 1,297.3 | 4,748 | 1.5 | 50.7 |
| Libya | MENA | 123 | 19.4 | 1,418.6 | 10,454 | 2.3 | 96.6 |
| Yemen, Rep. | MENA | 16 | .7 | 1,456.8 | 1,408.1 | 7.3 | 99 |
| Uzbekistan | Fmr Soviet | 42 | 1.6 | 1,459.1 | 1,878 | 13.3 | 96.5 |
| Austria | Europe | 1 | 1.7 | 1,536.7 | 50,557.8 | 4.4 | 6.8 |
| Poland | Europe | 1 | 50 | 1,538.3 | 13,776.5 | 18.3 | .1 |
| Sudan | SSA | 6 | .2 | 1,614.1 | 1,726.1 | 12.1 | 97 |
| Afghanistan | Asia | 1 | 0 | 1,634.8 | 653.3 | 8.0 | 99.8 |
| Tunisia | MENA | 609 | 54.4 | 1,677.6 | 4,248.9 | 4.0 | 99.8 |
| Kazakhstan | Fmr Soviet | 21 | 2.4 | 1,698.6 | 14,310 | 9.2 | 70.2 |

Note: This table is based on the Daesh personnel records, and lists the number of Daesh recruits by country of last residence, with country characteristics. The data sources are described in Section 2.1 and the table is also discussed in Section 4.1.

| Country | Region | Fighters (%) | Fighters per million Muslims | Distance to Syria (miles) | Per- capita GDP (USD) | Labor Force (millions) | Muslim Proportion |
|-----------------|------------|--------------|------------------------------|---------------------------|-----------------------|------------------------|-------------------|
| Pakistan | Asia | 21 | .1 | 1,788 | 1,275.7 | 63.6 | 96.4 |
| Switzerland | Europe | 2 | 5 | 1,796.7 | 84,669.3 | 4.7 | 5 |
| Tajikistan | Fmr Soviet | 55 | 7.9 | 1,799.5 | 1,048.7 | 3.6 | 99 |
| Germany | Europe | 84 | 52.5 | 1,815.5 | 45,600.8 | 42.8 | 2 |
| Sweden | Europe | 12 | 26.7 | 1,975.2 | 60,283.2 | 5.1 | 5 |
| Kyrgyzstan | Fmr Soviet | 38 | 7.7 | 1,984.5 | 1,282.4 | 2.7 | 88.8 |
| Denmark | Europe | 17 | 73.9 | 2,030.8 | 60,361.7 | 2.9 | 4.1 |
| Belgium | Europe | 26 | 39.5 | 2,037.8 | 46,622.5 | 5.0 | 5.9 |
| Netherlands | Europe | 22 | 26.7 | 2,044.4 | 51,425.1 | 9.0 | 5 |
| France | Europe | 148 | 29.5 | 2,066.7 | 42,571.2 | 30.1 | 7.5 |
| Somalia | SSA | 1 | .1 | 2102 | 521.2 | 3 | 98.9 |
| Norway | Europe | 4 | 24.5 | 2,161.5 | 10,2910.4 | 2.7 | 3.0 |
| Algeria | MENA | 26 | .6 | 2,239.8 | 5,491.6 | 12.1 | 98.2 |
| Spain | Europe | 12 | 6.4 | 2,350.8 | 29,370.7 | 23.4 | 4.1 |
| Kenya | SSA | 3 | 1 | 2,409.9 | 1,261.1 | 17.0 | 10.0 |
| Britain | Europe | 63 | 20.3 | 2456.3 | 42,294.9 | 32.8 | 4.8 |
| Cameroon | SSA | 2 | .4 | 2,543.1 | 1,331.2 | 8.9 | 20.9 |
| Ireland | Europe | 1 | 14.3 | 2,612 | 51,814.9 | 2.2 | 1.1 |
| India | Asia | 6 | 0 | 2616.5 | 1,456.2 | 487.9 | 14.2 |
| Morocco | MENA | 275 | 8.5 | 2,649.6 | 3,153.8 | 12.3 | 99.0 |
| Mauritania | SSA | 1 | .2 | 3,163.5 | 1,457.8 | 1.2 | 100.0 |
| Russia | Fmr Soviet | 171 | 18.2 | 3,374.3 | 15,543.7 | 76.9 | 6.5 |
| China | Asia | 50 | 2.3 | 3,607.7 | 6,991.9 | 801.8 | 1.8 |
| Malaysia | Asia | 1 | .1 | 4,533.9 | 10,973.7 | 13 | 61.4 |
| South Africa | SSA | 3 | 4.6 | 4,640.6 | 6,881.8 | 19.4 | 1.5 |
| Indonesia | Asia | 73 | .4 | 5,404.3 | 3,631.7 | 122.1 | 87.2 |
| Canada | Americas | 18 | 17.1 | 5,838.5 | 52,266.2 | 19.5 | 1.9 |
| Trinidad&Tobago | Americas | 3 | 38.5 | 6,373.1 | 20,217 | .7 | 5.8 |
| United States | Americas | 11 | 4.2 | 6,688.5 | 52,660.3 | 159.8 | 0.8 |
| Australia | Asia | 13 | 27.3 | 7,455.9 | 67,652.7 | 12.2 | 2.2 |

Note: This table is based on the Daesh personnel records, and lists the number of Daesh recruits by country of last residence, with country characteristics. The data sources are described in Section 2.1 and the table is also discussed in Section 4.1.

Table 2: Summary Statistics of Fighter Characteristics

| Fighter Characteristics | Mean (%) | Std. Error (%) | N (#) |
|---|-----------------|-----------------------|--------------|
| Age | | | |
| < = 20 years | 13.8 | 0.6 | 3,344 |
| 21 -30 years | 67.6 | 0.8 | 3,344 |
| 31+ years | 23.8 | 0.7 | 3,344 |
| Education | | | |
| Primary | 17.7 | 0.7 | 2,827 |
| Secondary | 51.7 | 0.9 | 2,827 |
| Tertiary | 30.6 | 0.9 | 2,827 |
| Religiosity Level | | | |
| Low | 68.7 | 0.9 | 2,634 |
| Medium | 26.2 | 0.9 | 2,634 |
| High | 5.1 | 0.4 | 2,634 |
| Previous Occupation | | | |
| No Job, Student, Retired or Illegal | 27.2 | 0.8 | 3,178 |
| Craftsperson, Manual/ Ag work, Security | 11.9 | 0.6 | 3,178 |
| Shop owner, Employee | 31.1 | 0.8 | 3,178 |
| Manager, Prof. Worker | 20.6 | 0.7 | 3,178 |
| Jihad Experience | 11.0 | 0.6 | 3,121 |
| Desired Role | | | |
| Admininstrator | 6.8 | 0.8 | 1,024 |
| Fighter | 54.2 | 1.6 | 1,024 |
| Suicide Fighter | 39.0 | 1.5 | 1,024 |

Note: This table displays summary statistics on Daesh foreign recruits from the Daesh personnel records used in this paper. This table is discussed in Section 2.1.

Table 3: Descriptive Statistics of Macroeconomic Variables

| Panel A: Country Level | | | | | |
|---|-------------|----------------|------------|------------|----------|
| Variable | Mean | St. Dev | Min | Max | N |
| Distance to Syria | 3,254 | 2,253 | 174 | 10,030 | 168 |
| Per capita GDP (thousand) | 14.6 | 20.8 | 0.26 | 113.73 | 164 |
| Human Development Index | 0.68 | 0.16 | 0.33 | 0.94 | 161 |
| Total Muslim population (millions) | 9.67 | 29.77 | 0.001 | 204.85 | 166 |
| Total population (millions) | 42.93 | 149 | 0.3 | 1357 | 165 |
| Corruption Index | 41.79 | 19.725 | 8 | 91 | 162 |
| Index of political rights | 3.543 | 2.124 | 1 | 7 | 162 |
| Ethnic fractionalization | 0.458 | 0.26 | 0 | 0.930 | 157 |
| Linguistic fractionalization | 0.403 | 0.288 | 0.002 | 0.923 | 154 |
| Religious fractionalization | 0.426 | 0.24 | 0.002 | 0.86 | 158 |
| Average self-reported religiosity | 0.743 | 0.244 | 0.142 | 0.998 | 162 |
| Government Restrictions Index | 3.352 | 2.199 | 0.2 | 9.1 | 164 |
| Social Hostilities Index | 2.659 | 2.494 | 0 | 9 | 164 |
| Panel B: Country-Education Level | | | | | |
| Variable | Mean | St. Dev | Min | Max | N |
| Relative wage | 0.67 | 0.31 | 0.05 | 1.78 | 154 |
| Unemployment rate | 9.70 | 7.86 | 0.10 | 45.40 | 359 |

Note: This table displays summary statistics of country-level and country-education level variables. The data sources are described Table A1. The relative wage is normalized to 1 for tertiary education. This table is discussed in Section 2.2.

Table 4: Determinants of Foreign Enrollment in Daesh - Close Countries

| VARIABLES | (1) $\log N_{ce}$ | (2) $\log N_{ce}$ | (3) $\log N_{ce}$ | (4) $\log N_{ce}$ | (5) $\log N_{ce}$ |
|-------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Unemployment rate | 0.061* (0.037) | 0.070*** (0.026) | 0.127*** (0.028) | 0.147*** (0.033) | 0.078* (0.040) |
| Total Labor force (log) | | | | 0.330 (0.201) | 0.041 (0.092) |
| Observations | 34 | 34 | 34 | 31 | 51 |
| Mean N_{ce} | 36.8 | 36.8 | 36.8 | 40.1 | 36.6 |
| Number of countries | 13 | 13 | 13 | 12 | 21 |
| Education Dummies | N | Y | Y | Y | Y |
| Country FE | N | N | Y | Y | Y |
| Adj. R-squared | 1.0e-04 | 5.4e-02 | .86 | .86 | .87 |

Note: Linear regression model used. Dependent variable is log of number of foreign recruits to Daesh by country and education category. Columns 1-4 are for countries at less than 500 miles distance from Syria, column 5 is for countries at below median distance from Syria. Standard errors in parentheses, clustered at the country level and corrected for small number of clusters whenever number of clusters ≤ 40 using Moulton correction factor. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent level, respectively. This table is discussed in Section 4.1.

Table 5: Determinants of Foreign Enrollment in Daesh - Distance Interaction and Different Daesh Aspiration

| VARIABLES | (1) <i>logN_{ce}</i> Total | (2) <i>logN_{ce}</i> Total | (3) <i>logN_{ce}</i> Total | (4) <i>logN_{ce}</i> Total | (5) <i>logNF_{ce}</i> | (6) <i>logNS_{ce}</i> | (7) <i>logNA_{ce}</i> |
|---|--|--|--|--|----------------------------------|----------------------------------|----------------------------------|
| Unemployment rate | 0.668*** (0.140) | | | | 0.537 (0.325) | 0.818* (0.391) | 1.243 (0.783) |
| Total Labor force(log) | -0.000 (0.082) | 0.027 (0.087) | 0.030 (0.089) | -0.063 (0.075) | 0.340 (0.217) | 0.395 (0.304) | 0.172 (0.624) |
| Interaction between unemployment and | | | | | | | |
| Distance to Syria (log) | -0.091*** (0.020) | | | | -0.065 (0.045) | -0.116* (0.057) | -0.158 (0.106) |
| Distance to Syria - First Half | | 0.068* (0.034) | | | | | |
| Distance to Syria - Second Half | | -0.050 (0.036) | | | | | |
| Distance to Syria - First Tercile | | | 0.124*** (0.026) | | | | |
| Distance to Syria - Second Tercile | | | -0.014 (0.028) | | | | |
| Distance to Syria - Third Tercile | | | -0.082* (0.047) | | | | |
| Distance to Syria - First Quartile | | | | 0.113*** (0.030) | | | |
| Distance to Syria - Second Quartile | | | | 0.009 (0.029) | | | |
| Distance to Syria - Third Quartile | | | | -0.008 (0.026) | | | |
| Distance to Syria - Fourth Quartile | | | | -0.160*** (0.037) | | | |
| Observations | 105 | 105 | 105 | 105 | 62 | 45 | 22 |
| Mean <i>N_{ce}</i> | 25.4 | 25.4 | 25.4 | 25.4 | x | x | x |
| Mean <i>NF_{ce}</i> | x | x | x | x | 7.9 | x | x |
| Mean <i>NS_{ce}</i> | x | x | x | x | x | 7.5 | x |
| Mean <i>NA_{ce}</i> | x | x | x | x | x | x | 2.8 |
| Country FE | Y | Y | Y | Y | Y | Y | Y |
| Number of countries | 44 | 44 | 44 | 44 | 32 | 24 | 13 |
| Education Dummies | Y | Y | Y | Y | Y | Y | Y |
| Adj. R-squared | .83 | .81 | .84 | .85 | .77 | .54 | .43 |

Note: Linear regression model used. Dependent variable is log of number of foreign recruits to Daesh by country and education category. Column 5, 6 and 7 include only those that aspire to become fighters, suicide fighters and administrators respectively. Standard errors in parentheses, clustered at the country level and corrected for small number of clusters whenever number of clusters ≤ 40 using Moulton correction factor. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent level, respectively. This table is discussed in Sections 4.2 and 4.3.2.

Table 6: Determinants of Foreign Enrollment in Daesh - Robustness of Distance Interaction (1/2)

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|----------------------|-------------------|-------------------|----------------------|----------------------|-------------------|----------------------|
| | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ |
| Unemployment rate | 0.668*** (0.140) | 0.324 (0.226) | -0.057 (0.043) | 0.745*** (0.193) | 0.558*** (0.198) | 0.002 (0.330) | 0.622* (0.312) |
| Total Labor force (log) | -0.000 (0.082) | 0.069 (0.108) | 0.080 (0.107) | 0.001 (0.082) | 0.009 (0.083) | 0.078 (0.108) | 0.007 (0.082) |
| Interaction between unemployment and | | | | | | | |
| Distance to Syria (log) | -0.091*** (0.020) | | | -0.083*** (0.024) | -0.079*** (0.024) | | -0.080*** (0.024) |
| Per capita GDP (log) | | -0.034 (0.024) | | -0.014 (0.025) | | -0.006 (0.032) | -0.006 (0.031) |
| Muslim fraction | | | 0.131* (0.067) | | 0.053 (0.074) | 0.117 (0.087) | 0.038 (0.083) |
| Observations | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| Mean N_{ce} | 25.5 | 25.5 | 25.5 | 25.5 | 25.5 | 25.5 | 25.5 |
| Number of countries | 44 | 44 | 44 | 44 | 44 | 44 | 44 |
| Country FE | Y | Y | Y | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y | Y | Y | Y |
| Adj. R-squared | .83 | .81 | .81 | .83 | .83 | .81 | .83 |

Note: Linear regression model used. Dependent variable is log of number of foreign recruits to Daesh by country and education category. Standard errors in parentheses, clustered at the country level and corrected for small number of clusters whenever number of clusters ≤ 40 using Moulton correction factor. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent level, respectively. This table is discussed in Section 4.2.1.

Table 7: Determinants of Foreign Enrollment in Daesh - Robustness of Distance Interaction (2/2)

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|----------------------|-------------------|--------------------|----------------------|----------------------|-------------------|----------------------|
| | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ |
| Unemployment rate | 0.668*** (0.140) | -0.029 (0.033) | 0.045 (0.030) | 0.663*** (0.168) | 0.598*** (0.144) | 0.034 (0.045) | 0.634*** (0.181) |
| Total Labor force (log) | -0.000 (0.082) | 0.078 (0.110) | 0.083 (0.112) | 0.000 (0.084) | 0.011 (0.086) | 0.082 (0.111) | 0.010 (0.089) |
| Interaction between unemployment and | | | | | | | |
| Distance to Syria (log) | -0.091*** (0.020) | | | -0.091*** (0.022) | -0.079*** (0.021) | | -0.082*** (0.023) |
| MENA region dummy | | 0.081 (0.065) | | 0.003 (0.069) | | 0.022 (0.072) | -0.026 (0.077) |
| OECD region dummy | | | -0.095* (0.052) | | -0.047 (0.053) | -0.088 (0.055) | -0.055 (0.055) |
| Observations | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| Mean N_{ce} | 25.5 | 25.5 | 25.5 | 25.5 | 25.5 | 25.5 | 25.5 |
| Number of countries | 44 | 44 | 44 | 44 | 44 | 44 | 44 |
| Country FE | Y | Y | Y | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y | Y | Y | Y |
| Adj. R-squared | .83 | .8 | .81 | .83 | .83 | .81 | .83 |

Note: Linear regression model used. Dependent variable is log of number of foreign recruits to Daesh by country and education category. Standard errors in parentheses, clustered at the country level and corrected for small number of clusters whenever number of clusters ≤ 40 using Moulton correction factor. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent level, respectively. This table is discussed in Section 4.2.1.

Table 8: Determinants of Foreign Enrollment in Daesh - Robustness Across Sub-Samples

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---------------------|---------------------|----------------------|---------------------|-------------------|----------------------|----------------------|
| | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ |
| | $N_c >= 33$ | $N_c >= 10$ | $N_c >= 0$ | Muslim Majority | Muslim Minority | Muslim prop < Median | Muslim prop > Median |
| Main effects | | | | | | | |
| Unemployment rate | 1.012** (0.416) | 0.587** (0.221) | 0.639*** (0.214) | 0.620** (0.263) | 0.668 (0.432) | 0.584 (0.400) | 0.593** (0.261) |
| Total Labor force(log) | 0.071 (0.222) | 0.075 (0.156) | 0.012 (0.108) | -0.048 (0.182) | -0.082 (0.161) | -0.022 (0.155) | 0.058 (0.192) |
| Interaction between unemployment and | | | | | | | |
| Distance to Syria (log) | -0.141** (0.057) | -0.080** (0.030) | -0.088*** (0.029) | -0.082** (0.038) | -0.087 (0.056) | -0.081 (0.052) | -0.074* (0.038) |
| Observations | 36 | 76 | 75 | 55 | 50 | 53 | 52 |
| Mean N_{ce} | 65.7 | 34.4 | 33.6 | 39.8 | 9.6 | 9.1 | 42 |
| Number of countries | 12 | 28 | 25 | 21 | 23 | 24 | 20 |
| Country FE | Y | Y | Y | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y | Y | Y | Y |
| Adj. R-squared | .732 | .793 | .838 | .841 | .744 | .746 | .833 |

Note: Linear regression model used. Dependent variable is log of number of foreign recruits to Daesh by country and education category. The threshold for N_c in column 1 is set such that countries with a number of recruits at or above this thresholds have at least one recruit in all three education categories. In column 2, we include all countries with at least ten recruits. In column 3, we include all countries that have at least one recruit in each education category. Columns 4 and 5 are estimated on countries in which Muslims account for more or less than 50% of the population. Columns 6 and 7 are estimated on countries below and above the median of the Muslim population share. Standard errors in parentheses, clustered at the country level and corrected for small number of clusters whenever number of clusters ≤ 40 using Moulton correction factor. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent level, respectively. This table is discussed in Section 4.3.1 and 4.3.5.

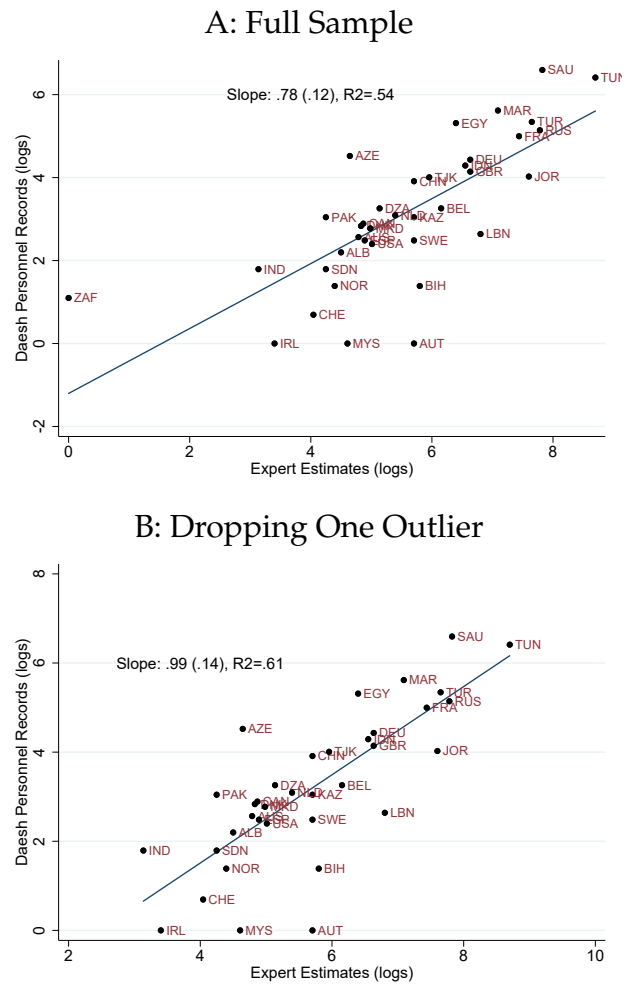
Table 9: Determinants of Foreign Enrollment in Daesh - Robustness to Wage Controls

| VARIABLES | (1) <i>logN_{ce}</i> | (2) <i>logN_{ce}</i> | (3) <i>logN_{ce}</i> | (4) <i>logN_{ce}</i> |
|---|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Unemployment rate | 0.668*** (0.140) | 0.443 (0.415) | 0.371 (0.401) | 0.436 (0.390) |
| Total Labor force (log) | -0.000 (0.082) | -0.042 (0.135) | -0.065 (0.131) | -0.051 (0.129) |
| Median wage (log) | | -0.435 (0.517) | | |
| Median wage among 18-36 old (log) | | | | -0.260 (0.283) |
| Interaction between unemployment and | | | | |
| Distance to Syria (log) | -0.091*** (0.020) | -0.056 (0.053) | -0.048 (0.051) | -0.055 (0.050) |
| Observations | 105 | 28 | 28 | 29 |
| Mean <i>N_{ce}</i> | 25.4 | 6.5 | 6.5 | 6.4 |
| Number of countries | 44 | 12 | 12 | 12 |
| Country FE | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y |
| Adj. R-squared | .83 | .62 | .63 | .63 |

Note: Linear regression model used. Dependent variable is log of number of foreign recruits to Daesh by country and education category. Standard errors in parentheses, clustered at the country level and corrected for small number of clusters whenever number of clusters ≤ 40 using Moulton correction factor. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent level, respectively. This table is discussed in Section 4.3.4.

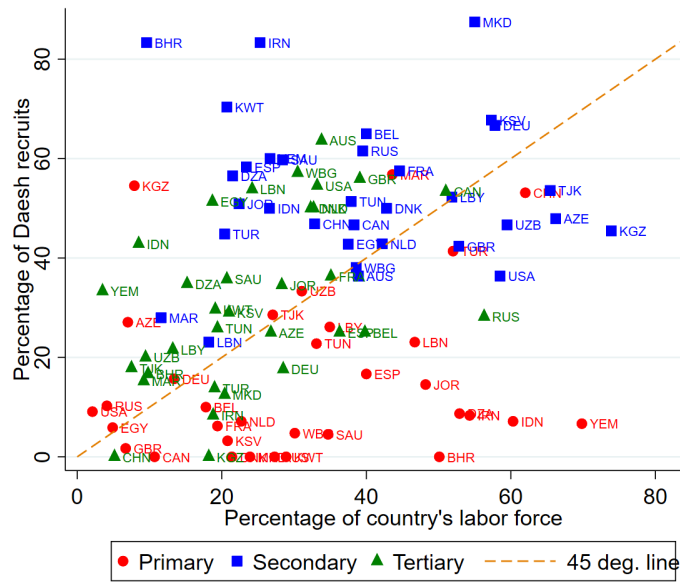
7 Figures

Figure 1: Comparison Between Daesh Personnel Records and Expert Estimates



Note: This figure plots the (log) number of Daesh recruits from expert estimates (used in [Benmelech and Klor \(2018\)](#)) against the numbers from our Daesh personnel records. We consider all countries with recruits in panel A and all countries minus South Africa (SAF, an outlier) in panel B. This figure is discussed in Section 2.1.

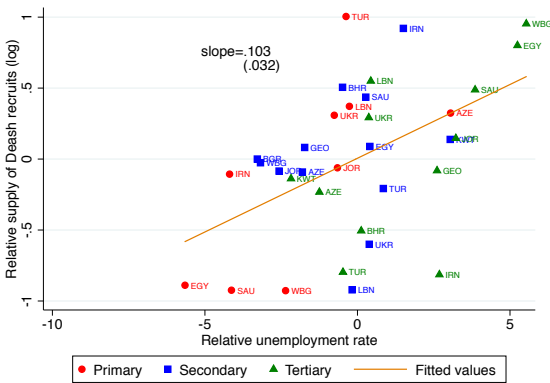
Figure 2: Schooling Attainment Among Daesh Recruits Relative to their Country of Last Residence



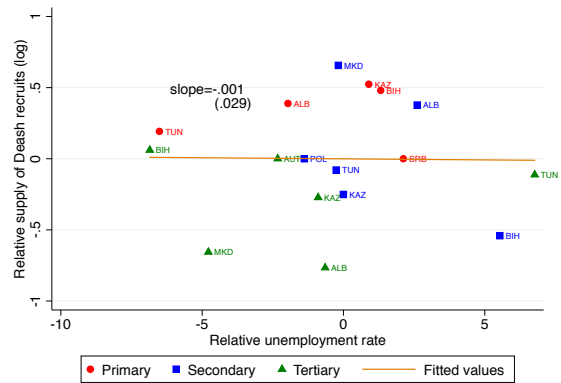
Note: This figure plots, for each country and education category, the share of individuals that obtained the relevant education level, in the country's general labor force and among the recruits appearing in our Daesh personnel records. To obtain stable shares, we focus on countries with more than 10 Daesh recruits. This figure is discussed in Section 2.1.

Figure 3: Relative Supply of Daesh recruits and Relative Unemployment Rate

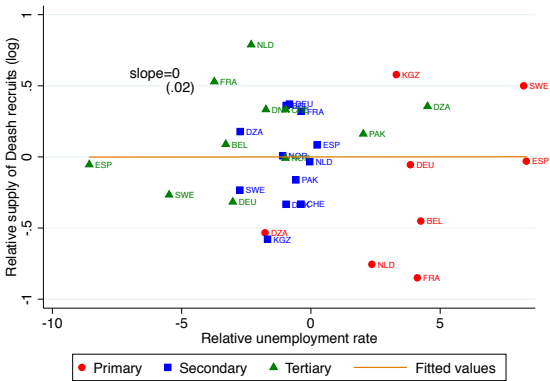
(a) Countries in Distance Quartile 1



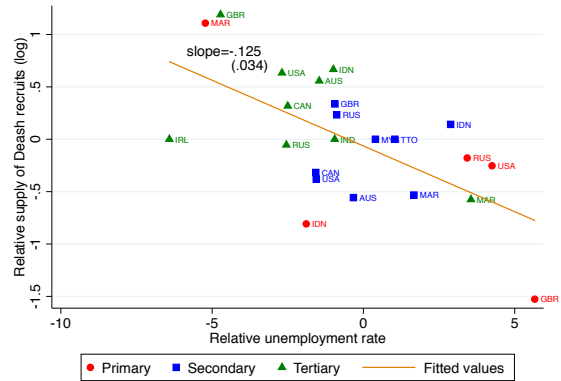
(b) Countries in Distance Quartile 2



(c) Countries in Distance Quartile 3

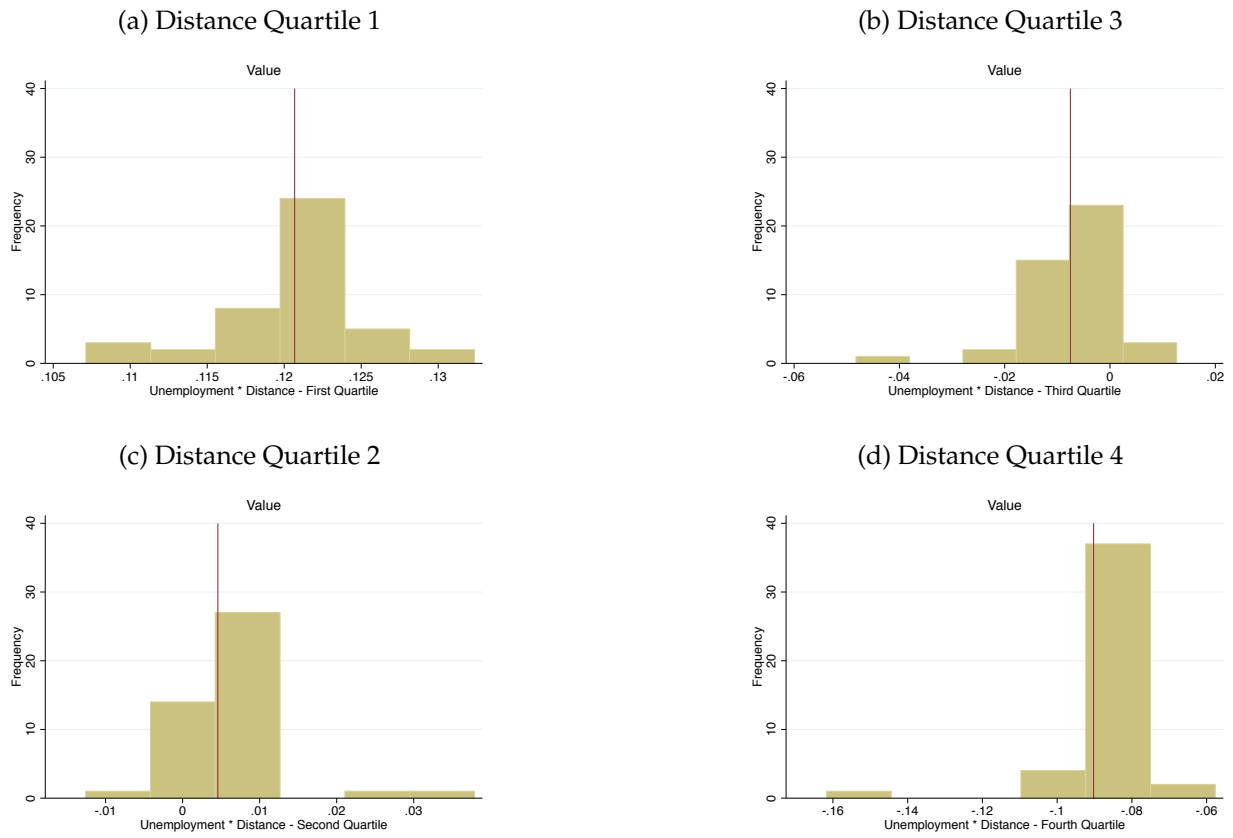


(d) Countries in Distance Quartile 4



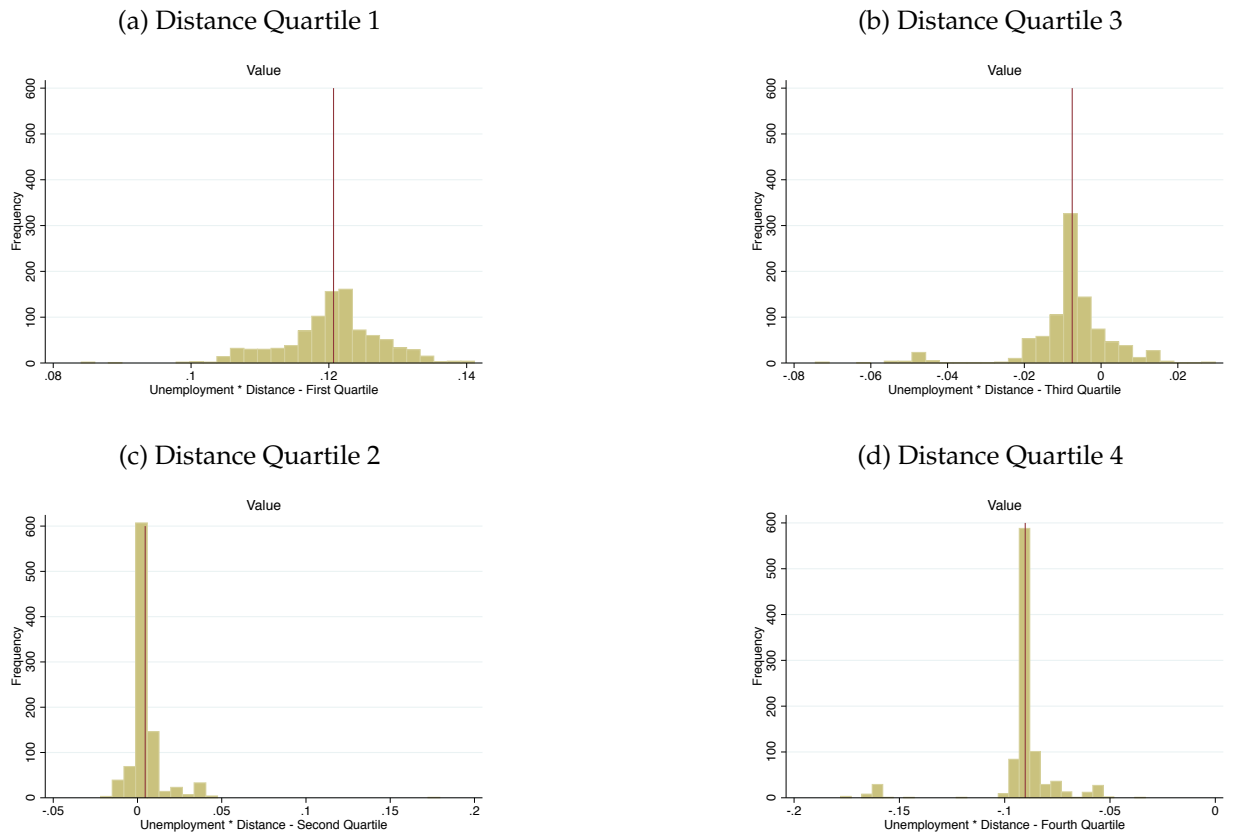
Note: This figure displays scatterplots of the residuals from a regression of unemployment (log number of Daesh foreign recruits) on country and education-category fixed effects and total labor force. The countries are divided into four quartile samples according to their distance from Syria. Each panel pertains to a different quartile. This figure is discussed in Section 4.2.

Figure 4: Distribution of Main Effect Estimates (1/2)



Note: These figures plot the distribution of point estimates β_i on the unemployment*distance-quartile interaction term, from the regression $\ln N_{ce} = \alpha + \mu_c + \gamma_e + \sum_i \beta_i \ln U_{ce.quartile_i} + \ln LF_{ce} + \epsilon_{ce}$, where we re-estimate the model 44 times, leaving one country out at a time. This figure is discussed in Section 4.3.2.

Figure 5: Distribution of Main Effect Estimates (2/2)



Note: This figure is identical to Figure 4, except that we leave out two countries in each iteration. This figure is discussed in Section 4.3.2.

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A Appendix

Table A1: Variable Descriptions

| Variable name | Description | Source |
|----------------------------------|---|-------------------------|
| LogNce | Log of number of Daesh recruits from country c by education categories: No education/Primary, Secondary and Tertiary level. Authors calc. | Daesh personnel records |
| LogNFce | Log of nb. of Daesh recruits who aspire to be fighters from country c by educ. categories: No educ./Prim., Sec. and Tertiary level. Authors calc. | Daesh personnel records |
| LogNSce | Log of nb. of Daesh recruits who aspire to be suicide fighters from country c by educ. categories: No educ./Prim., Sec. and Tertiary level. Authors calc. | Daesh personnel records |
| LogNAce | Log of nb. of Daesh recruits who aspire to be administrators from country c by educ. categories: No educ./Prim., Sec. and Tertiary level. Authors calc. | Daesh personnel records |
| Unemployment rate | Number of unemployed persons as a percentage of the total number of persons in the labor force by education categories: No education/Primary, Secondary and Tertiary level. Missing values were replaced from World Bank data. | ILOSTAT |
| Total Labor force (log) | Log of sum of the number of persons employed and the number of persons unemployed. | ILOSTAT |
| Median wage (log) | Median wage for men of all age groups and men aged 18-36 | I2D2 (World Bank) |
| 1{Nc >1} | Dummy variable which is one when a country sends at least one Daesh recruit and zero otherwise. | Daesh personnel records |
| Distance to Syria (log) | Log of air (flying) distance between centroid of a country and centroid of Syria in miles. | DistanceCalculator.net |
| Per capita GDP (log) | Log of Gross Domestic Product divided by midyear population. Data are in current U.S. dollars. | The World Bank Database |
| Muslim Pop. (log) | Log of Muslim population in a country divided by (1+1000000). Year: 2010. | Pew Research Center |
| Total Population (log) | Total population counts all residents regardless of legal status or citizenship. The values are midyear estimates and are logged. | The World Bank Database |
| Human Development Index | The index is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions. | The World Bank Database |
| Index of political rights | Political rights enable people to participate freely in the political process, including the right to vote freely for distinct alternatives in legitimate elections, compete for public office, join political parties and organizations, and elect representatives who have a decisive impact on public policies and are accountable to the electorate. The specific list of rights considered varies over the years. Countries are graded between 1 (most free) and 7 (least free). | Freedom House |

Note: This table presents the variables used in our analysis and is discussed in Section 2.2.

| Variable name | Description | Source |
|--------------------------------------|--|---|
| Corruption Index | The corruption perception index focuses on corruption in the public sector and defines corruption as the abuse of public office for private gain. The CPI Score relates to perceptions of the degree of corruption as seen by business people, risk analysts and the general public and ranges between 100 (highly clean) and 0 (highly corrupt). | Transparency International |
| Ethnic fractionalization | Reflects probability that two randomly selected people from a given country will not belong to the same ethnic group. | Alesina et al., 2003 |
| Linguistic fraction. | Reflects probability that two randomly selected people from a given country will not belong to the same linguistic group. | Alesina et al., 2003 |
| Religious fraction. | Reflects probability that two randomly selected people from a given country will not belong to the same religious group. | Alesina et al., 2003 |
| Average religiosity | Proportion of people who agree that religion is an important part of their daily life. | Gallup World Poll |
| Government Restrict. Index | The Government Restrictions Index (GRI) measures - on a 10-point scale - government laws, policies and actions that restrict religious beliefs or practices. The GRI is comprised of 20 measures of restrictions, including efforts by governments to ban particular faiths, prohibit conversions, limit preaching or give preferential treatment to one or more religious groups. | Pew Research Center's Global Restrictions on Religion study |
| Social Hostilities Index | The Social Hostilities Index (SHI) measures - on a 10-point scale - acts of religious hostility by private individuals, organizations and social groups. This includes mob or sectarian violence, harassment over attire for religious reasons and other religion-related intimidation or abuse. The SHI includes 13 measures of social hostilities. | Pew Research Center's Global Restrictions on Religion study |
| Domestic terrorism | Domestic terrorism is a dummy variable that indicates if any terrorist event took place in the country in 2013. | Global Terrorism Database |
| Government fractionalization | The probability that two deputies picked at random from among the government parties will be of different parties | Quality of Government Basic dataset |
| Polity index | The POLITY score is a unified polity scale ranging from +10 (strongly democratic) to -10 (strongly autocratic). It is computed by subtracting an indicator of autocracy from an indicator of democracy, both derived from codings of the competitiveness of political participation, the regulation of participation, the openness and competitiveness of executive recruitment, and constraints on the chief executive. | Polity IV project |
| Polity fragmentation | This variable codes the operational existence of a separate polity, or polities, comprising substantial territory and population within the recognized borders of the state and over which the coded polity exercises no effective authority | Polity IV project |
| Government Regul. of Religion | The government regulation index is a comparative measure of the actions of the state that deny religious freedoms including any actions that impinge on the practice, profession, or selection of religion. A higher GRI score indicates greater religious regulation. | The Religion and State project (ARDA) |
| Social Regulation of Religion | The social regulation index is a comparative measure of the restrictions placed on practice, profession, or selection of religion by other religious groups or associations or the culture at large. A higher SRI score indicates greater social regulation. | The Religion and State project (ARDA) |

Note: This table presents the variables used in our analysis and is discussed in Section 2.2.

Table A2: Cross-Country Analysis of Foreign Enrollment in Daesh, Extensive Margin

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|------------------------------|------------------------|------------------------|---|------------------------|------------------------|--|------------------------|------------------------|
| | $\mathbb{1}_{N_c > 0}$ | $\mathbb{1}_{N_c > 0}$ | Personnel Records $\mathbb{1}_{N_c > 0}$ | $\mathbb{1}_{N_c > 0}$ | $\mathbb{1}_{N_c > 0}$ | Expert Estimates $\mathbb{1}_{N_c > 0}$ | $\mathbb{1}_{N_c > 0}$ | $\mathbb{1}_{N_c > 0}$ |
| Total population (log) | 0.036 (0.029) | 0.022 (0.030) | 0.013 (0.031) | 0.011 (0.031) | 0.082*** (0.028) | 0.056* (0.030) | 0.032 (0.032) | 0.029 (0.032) |
| Muslim population (log) | 0.156*** (0.033) | 0.169*** (0.040) | 0.169*** (0.039) | 0.167*** (0.039) | 0.092** (0.037) | 0.117*** (0.042) | 0.127*** (0.040) | 0.131*** (0.041) |
| Unemployment rate | 0.013*** (0.005) | 0.011** (0.005) | 0.007 (0.006) | 0.008 (0.006) | 0.003 (0.006) | 0.003 (0.006) | 0.002 (0.006) | 0.002 (0.006) |
| Distance to Syria (log) | -0.149*** (0.046) | -0.144*** (0.052) | 0.035 (0.074) | 0.039 (0.074) | -0.051 (0.045) | -0.052 (0.054) | 0.083 (0.079) | 0.080 (0.079) |
| Per capita GDP (log) | 0.109*** (0.020) | 0.132*** (0.028) | 0.068** (0.031) | | 0.127*** (0.023) | 0.108*** (0.031) | 0.013 (0.040) | 0.013 (0.040) |
| Human Development Index | | | | 0.842** (0.370) | | | | 0.293 (0.473) |
| Index of political rights | | 0.026 (0.017) | 0.031* (0.018) | 0.033* (0.019) | | -0.001 (0.016) | 0.015 (0.017) | 0.019 (0.019) |
| Ethnic fractionalization | | 0.206 (0.163) | 0.329* (0.184) | 0.236 (0.166) | | -0.350 (0.235) | -0.137 (0.240) | -0.117 (0.269) |
| Linguistic fractionalization | | -0.283* (0.149) | -0.283 (0.191) | -0.150 (0.172) | | -0.028 (0.225) | -0.136 (0.262) | -0.144 (0.294) |
| Religious fractionalization | | 0.193 (0.141) | 0.224 (0.155) | 0.238 (0.155) | | 0.243* (0.143) | 0.296** (0.129) | 0.281** (0.131) |
| Observations | 160 | 148 | 148 | 147 | 160 | 148 | 148 | 147 |
| Adjusted R-squared | 0.411 | 0.412 | 0.465 | 0.472 | 0.301 | 0.318 | 0.382 | 0.381 |
| Mean Outcome | .356 | .358 | .358 | .354 | .288 | .304 | .304 | .306 |
| Region FE | N | N | Y | Y | N | N | Y | Y |

Note: This Table presents linear estimation of Daesh enrollment (dummy) on country-level characteristics. Columns 1-4 and 5-8 respectively replicate columns 1-4 of Table 7 in Benmelech and Klor (2018). In columns 1-4, we use our Daesh personnel records to construct the outcome variable, in columns 5-8 we use the expert estimates from Benmelech and Klor (2018). ***, **, and * indicate statistical significance at the 1, 5, and 10 percent level, respectively. This table is discussed in Section 2.1.

Table A3: Cross-Country Analysis of Foreign Enrollment in Daesh, Intensive Margin

| VARIABLES | (1) | | (2) | | (3) | | (4) | | (5) | | (6) | | (7) | | (8) | | |
|------------------------------|----------------------|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | Log(N+1) | Log(N+1) | Log(N+1) | Log(N+1) | Log(N+1) | Log(N+1) | Log(N+1) | Log(N+1) | Log(N+1) | Log(N+1) | Log(N+1) | Log(N+1) | Log(N+1) | Log(N+1) | Log(N+1) | Log(N+1) | |
| Total population (log) | 0.088 (0.087) | 0.033 (0.084) | 0.060 (0.082) | 0.049 (0.082) | 0.375*** (0.132) | 0.241* (0.132) | 0.186 (0.129) | 0.173 (0.129) | 0.708*** (0.188) | 0.850*** (0.212) | 0.868*** (0.201) | 0.888*** (0.207) | 0.888*** (0.207) | 0.868*** (0.201) | 0.868*** (0.201) | 0.868*** (0.201) | 0.868*** (0.201) |
| Muslim population (log) | 0.677*** (0.123) | 0.737*** (0.141) | 0.672*** (0.129) | 0.691*** (0.133) | 0.708*** (0.188) | 0.850*** (0.212) | 0.868*** (0.201) | 0.888*** (0.207) | 0.708*** (0.188) | 0.850*** (0.212) | 0.868*** (0.201) | 0.888*** (0.207) | 0.888*** (0.207) | 0.868*** (0.201) | 0.868*** (0.201) | 0.868*** (0.201) | 0.868*** (0.201) |
| Unemployment rate | 0.029** (0.013) | 0.028* (0.015) | 0.017 (0.014) | 0.016 (0.014) | 0.033 (0.029) | 0.040 (0.031) | 0.033 (0.032) | 0.032 (0.033) | 0.033 (0.029) | 0.040 (0.031) | 0.033 (0.032) | 0.032 (0.033) | 0.032 (0.033) | 0.033 (0.032) | 0.033 (0.032) | 0.032 (0.033) | 0.032 (0.033) |
| Distance to Syria (log) | -0.413*** (0.126) | -0.330** (0.144) | 0.371 (0.255) | 0.361 (0.255) | -0.370 (0.239) | -0.368 (0.276) | 0.237 (0.457) | 0.226 (0.460) | -0.370 (0.239) | -0.368 (0.276) | 0.237 (0.457) | 0.226 (0.460) | 0.226 (0.460) | 0.237 (0.457) | 0.237 (0.457) | 0.226 (0.460) | 0.226 (0.460) |
| Per capita GDP (log) | 0.395*** (0.064) | 0.446*** (0.095) | 0.059 (0.097) | 0.059 (0.097) | 0.736*** (0.104) | 0.623*** (0.148) | 0.087 (0.175) | 0.087 (0.175) | 0.736*** (0.104) | 0.623*** (0.148) | 0.087 (0.175) | 0.087 (0.175) | 0.087 (0.175) | 0.087 (0.175) | 0.087 (0.175) | 0.087 (0.175) | 0.087 (0.175) |
| Human Development Index | | | | 1.203 (1.126) | | | | 1.695 (1.993) | | | | | 1.695 (1.993) | | | 1.695 (1.993) | 1.695 (1.993) |
| Index of political rights | | 0.165*** (0.063) | 0.143*** (0.050) | 0.157*** (0.053) | | 0.034 (0.092) | 0.106 (0.092) | 0.123 (0.099) | | 0.034 (0.092) | 0.106 (0.092) | 0.123 (0.099) | 0.123 (0.099) | | 0.106 (0.092) | 0.123 (0.099) | 0.123 (0.099) |
| Ethnic fractionalization | | -0.006 (0.566) | -0.065 (0.503) | 0.028 (0.524) | | -2.280** (1.081) | -1.969* (1.079) | -1.913 (1.175) | | -2.280** (1.081) | -1.969* (1.079) | -1.913 (1.175) | -1.913 (1.175) | | -1.969* (1.079) | -1.913 (1.175) | -1.913 (1.175) |
| Linguistic fractionalization | | -1.212*** (0.425) | -0.747 (0.463) | -0.797 (0.521) | | -0.097 (0.944) | 0.005 (1.048) | 0.021 (1.181) | | -0.097 (0.944) | 0.005 (1.048) | 0.021 (1.181) | 0.021 (1.181) | | 0.005 (1.048) | 0.021 (1.181) | 0.021 (1.181) |
| Religious fractionalization | | 0.490 (0.435) | 0.702* (0.394) | 0.637 (0.400) | | 0.971 (0.740) | 1.287* (0.698) | 1.220* (0.732) | | 0.971 (0.740) | 1.287* (0.698) | 1.220* (0.732) | 1.220* (0.732) | | 1.287* (0.698) | 1.220* (0.732) | 1.220* (0.732) |
| Observations | 160 | 148 | 148 | 147 | 160 | 148 | 148 | 147 | 160 | 148 | 148 | 147 | 147 | 160 | 148 | 147 | 147 |
| Adjusted R-squared | 0.456 | 0.497 | 0.593 | 0.594 | 0.379 | 0.414 | 0.466 | 0.465 | 0.379 | 0.414 | 0.466 | 0.465 | 0.465 | 0.379 | 0.414 | 0.466 | 0.465 |
| Mean Outcome | 1.009 | 1.033 | 1.033 | 1.036 | 1.436 | 1.524 | 1.524 | 1.534 | 1.436 | 1.524 | 1.524 | 1.534 | 1.534 | 1.436 | 1.524 | 1.524 | 1.534 |
| Region FE | N | N | Y | Y | N | N | Y | Y | N | N | Y | Y | Y | N | N | Y | Y |

Note: This Table presents linear estimation of the number of Daesh recruits (long(N+1)) on country level characteristics. Columns 1-4 and 5-8 respectively replicate columns 1-4 of Table 8 in [Benmelech and Klor \(2018\)](#). In columns 1-4, we use our Daesh personnel records to construct the outcome variable, in columns 5-8 we use the expert estimates from [Benmelech and Klor \(2018\)](#). ***, **, * and . indicate statistical significance at the 1, 5, and 10 percent level, respectively. This table is discussed in Section 2.1.

Table A4: Determinants of Foreign Enrollment in Daesh - Bootstrapped Std. Errors

| VARIABLES | (1) <i>logN_{ce}</i> Total |
|---|--|
| Total Labor force (log) | -0.063 (0.108) |
| Interaction between unemployment and | |
| Distance to Syria -First Quartile | 0.113*** (0.035) |
| Distance to Syria - Second Quartile | 0.009 (0.082) |
| Distance to Syria - Third Quartile | -0.008 (0.033) |
| Distance to Syria - Fourth Quartile | -0.160*** (0.051) |
| Observations | 105 |
| Number of countries | 44 |
| Country FE | Y |
| Education Dummies | Y |
| Adj. R-squared | .85 |

Note: Linear regression model used. Dependent variable is log of number of foreign recruits to Daesh by country and education category. Standard errors in parentheses, are bootstrapped with 500 replications. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent level, respectively. This table is discussed in Section 4.2.

Table A5: Robustness of Distance Interaction: Ethnic and Linguistic Fractionalization

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|----------------------|-------------------|-------------------|----------------------|----------------------|-------------------|----------------------|
| | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ |
| Unemployment rate | 0.668*** (0.140) | -0.021 (0.052) | -0.014 (0.052) | 0.735*** (0.216) | 0.742*** (0.217) | -0.019 (0.055) | 0.734*** (0.214) |
| Total Labor force(log) | -0.000 (0.082) | 0.075 (0.117) | 0.074 (0.118) | -0.002 (0.080) | -0.004 (0.081) | 0.078 (0.119) | -0.001 (0.081) |
| Interaction between unemployment and | | | | | | | |
| Distance to Syria (log) | -0.091*** (0.020) | | | -0.102*** (0.028) | -0.102*** (0.029) | | -0.102*** (0.028) |
| Ethnic fractionalization | | 0.039 (0.107) | | 0.042 (0.106) | | 0.075 (0.168) | 0.056 (0.173) |
| Linguistic fractionalization | | | 0.017 (0.113) | | 0.029 (0.109) | -0.044 (0.177) | -0.017 (0.178) |
| Observations | 105 | 101 | 101 | 101 | 101 | 101 | 101 |
| Mean N_{ce} | 25.5 | 26.3 | 26.3 | 26.3 | 26.3 | 26.3 | 26.3 |
| Number of countries | 44 | 42 | 42 | 42 | 42 | 42 | 42 |
| Country FE | Y | Y | Y | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y | Y | Y | Y |
| Adj. R-squared | .83 | .81 | .81 | .83 | .83 | .8 | .83 |

Note: This table is similar to "horse-race" Tables 6 and 7, except that we now add additional interactions between distance and ethnic and linguistic fractionalization. The variables are described in Table A1. This table is discussed in Section 4.2.1.

Table A6: Robustness of Distance Interaction: Religious and Government Fractionalization

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|----------------------|--------------------|-------------------|----------------------|----------------------|--------------------|----------------------|
| | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ |
| Unemployment rate | 0.668*** (0.140) | 0.051 (0.043) | 0.007 (0.031) | 0.727*** (0.240) | 0.753*** (0.206) | 0.081 (0.050) | 0.732*** (0.229) |
| Total Labor force(log) | -0.000 (0.082) | 0.068 (0.108) | 0.087 (0.121) | -0.000 (0.079) | 0.009 (0.082) | 0.084 (0.114) | 0.015 (0.083) |
| Interaction between unemployment and | | | | | | | |
| Distance to Syria (log) | -0.091*** (0.020) | | | -0.093*** (0.032) | -0.101*** (0.027) | | -0.090*** (0.030) |
| Religious fractionalization | | -0.167* (0.099) | | -0.127 (0.101) | | -0.185* (0.102) | -0.143 (0.098) |
| Government fractionalization | | | -0.058 (0.076) | | -0.050 (0.069) | -0.082 (0.076) | -0.069 (0.066) |
| Observations | 105 | 101 | 101 | 101 | 101 | 101 | 101 |
| Mean N_{ce} | 25.5 | 26.3 | 26.3 | 26.3 | 26.3 | 26.3 | 26.3 |
| Number of countries | 44 | 42 | 42 | 42 | 42 | 42 | 42 |
| Country FE | Y | Y | Y | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y | Y | Y | Y |
| Adj. R-squared | .83 | .82 | .81 | .84 | .83 | .82 | .84 |

Note: This table is similar to "horse-race" Tables 6 and 7, except that we add additional interactions between distance and religious and political fractionalization. The variables are described in Table A1. This table is discussed in Section 4.2.1.

Table A7: Robustness of Distance Interaction: Political Rights and Corruption

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|----------------------|-------------------|-------------------|---------------------|----------------------|-------------------|---------------------|
| | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ |
| Unemployment rate | 0.668*** (0.140) | -0.080 (0.049) | 0.092 (0.078) | 0.533** (0.256) | 0.729*** (0.208) | -0.093 (0.156) | 0.579** (0.281) |
| Total Labor force(log) | -0.000 (0.082) | 0.102 (0.112) | 0.083 (0.109) | 0.031 (0.088) | 0.011 (0.082) | 0.103 (0.114) | 0.028 (0.086) |
| Interaction between unemployment and | | | | | | | |
| Distance to Syria (log) | -0.091*** (0.020) | | | -0.079** (0.031) | -0.091*** (0.031) | | -0.080** (0.030) |
| Political rights | | 0.025* (0.012) | | 0.015 (0.012) | | 0.026 (0.018) | 0.011 (0.019) |
| Corruption index | | | -0.002 (0.002) | | -0.001 (0.001) | 0.000 (0.002) | -0.000 (0.002) |
| Observations | 105 | 102 | 102 | 102 | 102 | 102 | 102 |
| Mean N_{ce} | 25.5 | 26 | 26 | 26 | 26 | 26 | 26 |
| Number of countries | 44 | 43 | 43 | 43 | 43 | 43 | 43 |
| Country FE | Y | Y | Y | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y | Y | Y | Y |
| Adj. R-squared | .83 | .83 | .82 | .84 | .83 | .82 | .83 |

Note: This table is similar to "horse-race" Tables 6 and 7, except that we add additional interactions between distance and political rights and corruption. The variables are described in Table A1. This table is discussed in Section 4.2.1.

Table A8: Robustness of Distance Interaction: Polity Index and Polity Fragmentation

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|----------------------|--------------------|-------------------|---------------------|----------------------|-------------------|---------------------|
| | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ |
| Unemployment rate | 0.668*** (0.140) | 0.030 (0.031) | -0.011 (0.027) | 0.708** (0.279) | 0.852*** (0.267) | 0.028 (0.033) | 0.758** (0.314) |
| Total Labor force(log) | -0.000 (0.082) | 0.101 (0.120) | 0.073 (0.116) | 0.030 (0.091) | -0.005 (0.076) | 0.104 (0.123) | 0.020 (0.088) |
| Interaction between unemployment and | | | | | | | |
| Distance to Syria (log) | -0.091*** (0.020) | | | -0.095** (0.039) | -0.115*** (0.035) | | -0.101** (0.044) |
| Polity index | | -0.007* (0.004) | | -0.002 (0.005) | | -0.007 (0.004) | -0.002 (0.005) |
| Polity fragmentation (dummy) | | | 0.016 (0.033) | | -0.046 (0.030) | 0.020 (0.025) | -0.031 (0.032) |
| Observations | 105 | 99 | 102 | 99 | 102 | 99 | 99 |
| Mean N_{ce} | 25.5 | 26.8 | 26 | 26.8 | 26 | 26.8 | 26.8 |
| Number of countries | 44 | 42 | 43 | 42 | 43 | 42 | 42 |
| Country FE | Y | Y | Y | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y | Y | Y | Y |
| Adj. R-squared | .83 | .81 | .81 | .83 | .83 | .81 | .82 |

Note: This table is similar to "horse-race" Tables 6 and 7, except that we add additional interactions between distance and the polity index and polity fragmentation. The variables are described in Table A1. This table is discussed in Section 4.2.1.

Table A9: Robustness of Distance Interaction: Social and Government Regulation of Religion

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|----------------------|-------------------|-------------------|----------------------|----------------------|-------------------|----------------------|
| | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ |
| Unemployment rate | 0.668*** (0.140) | -0.073 (0.086) | -0.047 (0.059) | 0.679*** (0.231) | 0.666*** (0.173) | -0.067 (0.088) | 0.716*** (0.254) |
| Total Labor force(log) | -0.000 (0.082) | 0.086 (0.124) | 0.085 (0.125) | 0.027 (0.094) | 0.030 (0.095) | 0.087 (0.125) | 0.026 (0.095) |
| Interaction between unemployment and | | | | | | | |
| Distance to Syria (log) | -0.091*** (0.020) | | | -0.096*** (0.027) | -0.094*** (0.023) | | -0.099*** (0.030) |
| Social regulation of religion | | 0.014 (0.013) | | 0.003 (0.011) | | 0.009 (0.022) | -0.007 (0.019) |
| Government regulation of religion | | | 0.012 (0.010) | | 0.005 (0.009) | 0.005 (0.018) | 0.010 (0.015) |
| Observations | 105 | 101 | 101 | 101 | 101 | 101 | 101 |
| Mean N_{ce} | 25.5 | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 |
| Number of countries | 44 | 42 | 42 | 42 | 42 | 42 | 42 |
| Country FE | Y | Y | Y | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y | Y | Y | Y |
| Adj. R-squared | .83 | .81 | .81 | .83 | .83 | .8 | .83 |

Note: This table is similar to "horse-race" Tables 6 and 7, except that we add additional interactions between distance and social and government regulation of religion. The variables are described in Table A1. This table is discussed in Section 4.2.1.

Table A10: Robustness of Distance Interaction: Region Interactions

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
|---|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | $\log N_{ce}$ Total | $\log N_{ce}$ Total | $\log N_{ce}$ Total | $\log N_{ce}$ Total | $\log N_{ce}$ Total | $\log N_{ce}$ Total |
| Unemployment rate | | -0.029 (0.033) | 0.032 (0.035) | -0.004 (0.025) | 0.001 (0.025) | 0.003 (0.025) |
| Total Labor force (log) | 0.111 (0.147) | 0.078 (0.110) | 0.127 (0.141) | 0.128 (0.148) | 0.083 (0.123) | 0.060 (0.125) |
| Interaction between unemployment and | | | | | | |
| MENA | 0.052 (0.048) | 0.081 (0.065) | | | | |
| Europe | -0.032 (0.039) | | -0.057 (0.055) | | | |
| Former Soviet | 0.061 (0.075) | | | 0.094 (0.076) | | |
| Asia | -0.018 (0.109) | | | | -0.017 (0.104) | |
| Americas | -0.071 (0.045) | | | | | -0.069 (0.043) |
| Observations | 105 | 105 | 105 | 105 | 105 | 105 |
| Mean N_{ce} | 25.4 | 25.4 | 25.4 | 25.4 | 25.4 | 25.4 |
| Country FE | Y | Y | Y | Y | Y | Y |
| Number of countries | 44 | 44 | 44 | 44 | 44 | 44 |
| Education Dummies | Y | Y | Y | Y | Y | Y |
| Adj. R-squared | .8 | .8 | .8 | .8 | .79 | .79 |

Note: Linear regression model used. Dependent variable is log of number of foreign recruits to Daesh by country and education category. Standard errors in parentheses, clustered at the country level and corrected for small number of clusters whenever number of clusters ≤ 40 using Moulton correction factor. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent level, respectively. This table is discussed in Section 4.2.1.

Table A11: DDD Estimation of Substitution Between Daesh and Domestic Terrorism

| Post Daesh Definition | (1) | (2) | (3) | (4) | (5) | (6) |
|--|------------------------------------|----------------------|----------------------|---------------------------------|--------------------|--------------------|
| | Outcome: Log(N terrorist events+1) | | | Outcome: 1(Any terrorist event) | | |
| | Post 2011 | Post 2012 | Post 2013 | Post 2011 | Post 2012 | Post 2013 |
| Unemployment Rate (Fraction) | -0.901 (2.092) | -1.109 (2.172) | -1.133 (2.177) | 0.025 (0.668) | -0.120 (0.682) | -0.157 (0.674) |
| Distance * Post Daesh | 0.717*** (0.261) | 0.860*** (0.318) | 1.062*** (0.359) | 0.108 (0.098) | 0.197 (0.140) | 0.278** (0.125) |
| Distance* Unemployment Rate | 13.863*** (4.476) | 15.025*** (4.449) | 16.294*** (4.405) | 2.857* (1.532) | 3.177** (1.569) | 3.319** (1.577) |
| Unemployment Rate * Post Daesh | 0.429 (1.218) | 0.972 (1.294) | 1.306 (1.356) | -0.214 (0.318) | 0.108 (0.357) | 0.264 (0.376) |
| Distance* Unemployment Rate * Post Daesh | -2.784 (2.625) | -3.784 (3.783) | -4.874 (3.707) | -0.708 (1.266) | -1.521 (1.913) | -1.918 (1.644) |
| Observations | 1,639 | 1,639 | 1,639 | 1,639 | 1,639 | 1,639 |
| Number of countries | 149 | 149 | 149 | 149 | 149 | 149 |
| Country FE | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y |

Note: This table display estimates of equation 4.2.2. The outcome is the log(N terrorist events +1) in columns 1-3, and a dummy for any terrorist event in columns 4-6, based on the [Global Terrorism Database](#). The *Distance* dummy indicates countries in the fourth distance quartile. Countries in the first distance quartile are dropped from the analysis, as they may be affected by direct spillovers from Daesh. The *Post* dummy indicates years after 2011, 2012 or 2013, as per the column headings. Standard errors, clustered at the country level, are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent level, respectively. This table is discussed in Section 4.2.2.

Table A12: Controlling for Domestic Terrorism in Main Estimation

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
|---|----------------------|----------------------|--------------------|----------------------|----------------------|--------------------|
| | $Log(N_{ce})$ | $Log(N_{ce})$ | $Log(N_{ce})$ | $Log(N_{ce})$ | $Log(N_{ce})$ | $Log(N_{ce})$ |
| Unemployment rate | 0.668*** (0.140) | 0.678*** (0.147) | 1.328** (0.646) | 0.479** (0.181) | 0.548*** (0.180) | 1.445** (0.694) |
| Total Labor force (log) | -0.000 (0.082) | 0.009 (0.086) | 0.018 (0.091) | | | |
| Interaction between unemployment and | | | | | | |
| Distance to Syria (log) | -0.091*** (0.020) | -0.090*** (0.021) | -0.175* (0.088) | -0.068*** (0.025) | -0.071*** (0.026) | -0.190* (0.095) |
| Domestic Terrorism | | -0.032 (0.052) | -0.759 (0.668) | | -0.061 (0.049) | -1.039 (0.712) |
| Domestic Terrorism * Log Distance | | | 0.096 (0.090) | | | 0.130 (0.097) |
| Observations | 105 | 105 | 105 | 114 | 114 | 114 |
| Mean N_{ce} | 25.4 | 25.4 | 25.4 | 23.9 | 23.9 | 23.9 |
| Number of countries | 44 | 44 | 44 | 47 | 47 | 47 |
| Country FE | Y | Y | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y | Y | Y |
| Adj. R-squared | .83 | .83 | .83 | .81 | .82 | .82 |

Note: This table display estimates of our main estimating model, equation 2, with additional interaction terms between unemployment, distance and domestic terrorism. Domestic terrorism is a dummy variable that indicates if any terrorist event took place in the country in 2013. The data is from the [Global Terrorism Database](#). The outcome is the log(N Daesh recruits). Standard errors, clustered at the country level, are in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent level, respectively. This table is discussed in Section 4.2.2.

Table A13: Robustness to Dropping Countries With Deviation Between Muslim Male and General Male Unemployment Rate

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---------------|---------------|--|---------------|--|---------------|
| | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ |
| | All Countries | | Dropping Countries With Deviation > 40% | | Dropping Countries With Deviation > 20% | |
| Unemployment rate | 0.668*** | | 0.631*** | | 0.587*** | |
| | (0.140) | | (0.128) | | (0.126) | |
| Total Labor force(log) | -0.000 | -0.063 | -0.022 | -0.042 | -0.031 | -0.048 |
| | (0.082) | (0.075) | (0.078) | (0.075) | (0.077) | (0.073) |
| Interaction between unemployment and | | | | | | |
| Distance to Syria (log) | -0.091*** | | -0.085*** | | -0.079*** | |
| | (0.020) | | (0.017) | | (0.017) | |
| Distance to Syria - First Quartile | | 0.113*** | | 0.116*** | | 0.113*** |
| | | (0.030) | | (0.030) | | (0.030) |
| Distance to Syria - Second Quartile | | 0.009 | | 0.011 | | -0.006 |
| | | (0.029) | | (0.030) | | (0.018) |
| Distance to Syria - Third Quartile | | -0.008 | | -0.005 | | -0.003 |
| | | (0.026) | | (0.025) | | (0.024) |
| Distance to Syria - Fourth Quartile | | -0.160*** | | -0.136*** | | -0.131*** |
| | | (0.037) | | (0.039) | | (0.041) |
| Observations | 105 | 105 | 85 | 85 | 78 | 78 |
| Mean N _{ce} | 25.4 | 25.4 | 27.6 | 27.6 | 29.3 | 29.3 |
| Number of countries | 44 | 44 | 35 | 35 | 31 | 31 |
| Country FE | Y | Y | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y | Y | Y |
| Adj. R-squared | .83 | .85 | .84 | .85 | .85 | .86 |

Note: Columns 1 and 2 report our main results, as in Table 5, columns 1 and 4. Columns 3 and 4 (5 and 6) repeat the same estimations, after dropping countries for which the deviation between the Muslim male unemployment rate and the general male unemployment rate is more than 40% (more than 20%). The deviation is calculated as $| (MuslimMaleUnemploymentRate - GeneralMaleUnemploymentRate) | / (MuslimMaleUnemploymentRate)$. This table is discussed in Section 4.3.1.

Table A14: Robustness to Interacting Unemployment with Country Characteristics

| VARIABLES | (1) <i>logN_{ce}</i> | (2) <i>logN_{ce}</i> | (3) <i>logN_{ce}</i> | (4) <i>logN_{ce}</i> | (5) <i>logN_{ce}</i> |
|---|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Main effects | | | | | |
| Unemployment rate | 0.636*** (0.227) | 0.576** (0.233) | 0.653*** (0.209) | 0.663*** (0.229) | 0.598*** (0.208) |
| Total Labor force(log) | 0.002 (0.103) | 0.002 (0.102) | 0.000 (0.103) | 0.000 (0.103) | 0.011 (0.102) |
| Interaction between unemployment and | | | | | |
| Distance to Syria (log) | -0.088*** (0.030) | -0.081*** (0.030) | -0.088*** (0.030) | -0.091*** (0.030) | -0.079*** (0.029) |
| Muslim > 50% | 0.013 (0.043) | | | | |
| Muslim Majority | | 0.038 (0.050) | | | |
| Above-Median GDPpc | | | -0.011 (0.047) | | |
| MENA region dummy | | | | 0.003 (0.063) | |
| Official OECD region dummy | | | | | -0.047 (0.045) |
| Observations | 105 | 105 | 105 | 105 | 105 |
| Mean <i>N_{ce}</i> | 25.4 | 25.4 | 25.4 | 25.4 | 25.4 |
| Number of countries | 44 | 44 | 44 | 44 | 44 |
| Country FE | Y | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y | Y |
| Adj. R-squared | 0.829 | 0.830 | 0.829 | 0.828 | 0.832 |

Note: This table repeats our main estimation from Table 5, column 1, adding interaction terms between the unemployment rate and various country characteristics (including indicators for Muslim majority countries as used in the sample splits in Table 8). This table is discussed in Section 4.3.1.

Table A15: Robustness to Interacting Unemployment with Distance and Country Characteristics

| VARIABLES | (1) <i>logN_{ce}</i> | (2) <i>logN_{ce}</i> | (3) <i>logN_{ce}</i> | (4) <i>logN_{ce}</i> | (5) <i>logN_{ce}</i> |
|---|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Main effects | | | | | |
| Unemployment rate | 0.646*** (0.212) | 0.602*** (0.216) | 0.644*** (0.213) | 0.671*** (0.213) | 0.591*** (0.211) |
| Total Labor force(log) | 0.002 (0.103) | 0.001 (0.102) | -0.000 (0.103) | -0.000 (0.103) | 0.010 (0.102) |
| Interaction between unemployment and | | | | | |
| Distance to Syria (log) | -0.089*** (0.028) | -0.085*** (0.028) | -0.087*** (0.030) | -0.092*** (0.028) | -0.078** (0.030) |
| Distance * Muslim >50% | 0.002 (0.006) | | | | |
| Distance * Muslim Majority | | 0.005 (0.007) | | | |
| Distance * Above-Median GDPpc | | | -0.002 (0.006) | | |
| Distance * MENA | | | | -0.000 (0.009) | |
| Distance * OECD | | | | | -0.006 (0.006) |
| Observations | 105 | 105 | 105 | 105 | 105 |
| Mean <i>N_{ce}</i> | 25.4 | 25.4 | 25.4 | 25.4 | 25.4 |
| Number of countries | 44 | 44 | 44 | 44 | 44 |
| Country FE | Y | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y | Y |
| Adj. R-squared | 0.829 | 0.830 | 0.829 | 0.828 | 0.832 |

Note: This table repeats our main estimation from Table 5, column 1, adding interaction terms between unemployment*distance and various country characteristics (including indicators for Muslim majority countries as used in the sample splits in Table 8). This table is discussed in Section 4.3.1.

Table A16: Determinants of Foreign Enrollment in Daesh - Poisson Estimation

| VARIABLES | (1) | (2) | (3) | (4) |
|---|----------------------|----------------------|----------------------|----------------------|
| | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ | $\log N_{ce}$ |
| Unemployment rate | 1.105*** (0.361) | | | |
| Total Labor force (log) | 0.207 (0.201) | 0.140 (0.143) | 0.082 (0.192) | 0.004 (0.188) |
| Interaction between unemployment and | | | | |
| Distance to Syria (log) | -0.151*** (0.049) | | | |
| Distance to Syria - First Half | | 0.072 (0.049) | | |
| Distance to Syria - Second Half | | -0.122*** (0.039) | | |
| Distance to Syria - First Tercile | | | 0.133*** (0.022) | |
| Distance to Syria - Second Tercile | | | -0.019 (0.021) | |
| Distance to Syria - Third Tercile | | | -0.159*** (0.055) | |
| Distance to Syria - First Quartile | | | | 0.146*** (0.023) |
| Distance to Syria - Second Quartile | | | | -0.006 (0.022) |
| Distance to Syria - Third Quartile | | | | -0.050 (0.041) |
| Distance to Syria - Fourth Quartile | | | | -0.189*** (0.053) |
| Observations | 132 | 132 | 132 | 132 |
| Mean N_{ce} | 20.2 | 20.2 | 20.2 | 20.2 |
| Number of countries | 44 | 44 | 44 | 44 |
| Country FE | Y | Y | Y | Y |
| Education Dummies | Y | Y | Y | Y |
| Adj. R-squared | .83 | .82 | .84 | .85 |

Note: Poisson Pseudo Maximum Likelihood Estimator used. Dependent variable is the number of foreign recruits to Daesh by country and education category. Standard errors in parentheses, clustered at the country level and corrected for small number of clusters whenever number of clusters ≤ 40 using Moulton correction factor. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent level, respectively. This table is discussed in Sections 4.3.3 and 4.3.5.

Table A17: Determinants of Foreign Enrollment in Daesh - Robustness to Different Distance Measures

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | logN | logN | logN | logN | logN | logN | logN | logN | logN | logN | logN | logN | logN |
| Unemployment rate | 0.668*** (0.140) | 0.658*** (0.219) | 0.762*** (0.232) | 0.739*** (0.226) | 0.759*** (0.234) | 0.788*** (0.232) | 0.887*** (0.225) | 0.858*** (0.229) | 0.886*** (0.227) | 0.688*** (0.226) | 0.734*** (0.224) | 0.740*** (0.214) | 0.728*** (0.222) |
| Total Labor force (log) | -0.000 (0.082) | 0.005 (0.079) | 0.016 (0.085) | 0.043 (0.094) | 0.021 (0.087) | -0.019 (0.076) | -0.005 (0.081) | 0.026 (0.088) | 0.000 (0.083) | -0.003 (0.078) | 0.008 (0.084) | 0.030 (0.090) | 0.013 (0.085) |
| Interaction between unemployment and | | | | | | | | | | | | | |
| Distance to Syria (log) | -0.091*** (0.020) | -0.086*** (0.028) | -0.099*** (0.030) | -0.095*** (0.029) | -0.098*** (0.030) | -0.102*** (0.030) | -0.114*** (0.029) | -0.109*** (0.029) | -0.114*** (0.029) | -0.089*** (0.029) | -0.094*** (0.028) | -0.094*** (0.027) | -0.093*** (0.028) |
| Observations | 105 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 |
| Mean N_{ct} | 25.5 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Country FE | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Number of countries | 44 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 |
| Education Dummies | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Adj. R-squared | 0.832 | 0.830 | 0.831 | 0.831 | 0.831 | 0.849 | 0.851 | 0.850 | 0.850 | 0.829 | 0.829 | 0.830 | 0.828 |

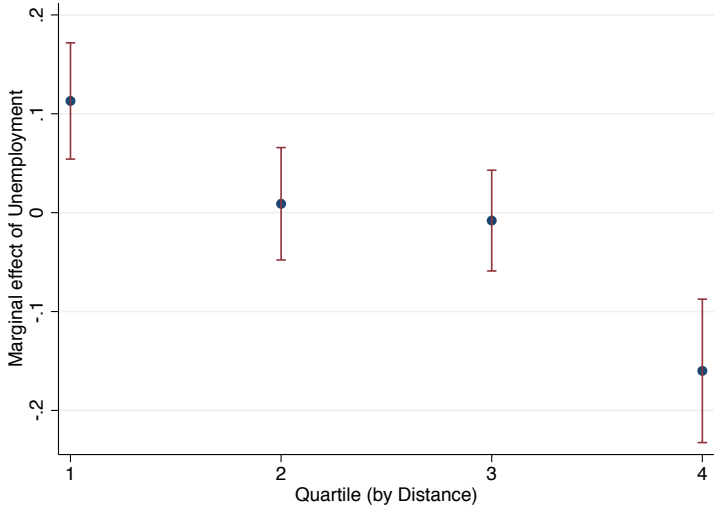
Note: Linear regression model used. Dependent variable is log of number of foreign recruits to Daesh by country and education category. The first column replicates our main result from Table 5, column 1. Columns 2-5 measure distance from a country's most populous city, columns 6-9 measure it from the capital city, columns 10-13 measure it from the country's geographic center. Columns 2, 6, 10 measure distance to Damascus; columns 3, 7, 11 measure distance to Raqqa; columns 4, 8, 12 measure distance to Mosul; columns 5, 9, 13 measure distance to Tell Abyad (the primary entry point to Daesh territory during the period covered by our data). This table is discussed in Section 4.3.6.

Table A18: Wages, Unemployment and Daesh Recruits Data Overlap

| | Wages | Unemployment | Daesh recruits | | Wages | Unemployment | Daesh recruits | | Wages | Unemployment | Daesh recruits |
|-----|-------|--------------|----------------|-----|-------|--------------|----------------|-----|-------|--------------|----------------|
| AFG | ☐ | ☐ | ■ | GMB | ■ | ■ | ☐ | NIC | ☐ | ■ | ☐ |
| AGO | ☐ | ☐ | ☐ | GNB | ☐ | ☐ | ☐ | NLD | ☐ | ■ | ■ |
| ALB | ■ | ■ | ■ | GNQ | ☐ | ☐ | ☐ | NOR | ☐ | ■ | ■ |
| ARE | ☐ | ■ | ☐ | GRC | ☐ | ■ | ☐ | NPL | ■ | ■ | ☐ |
| ARG | ☐ | ■ | ☐ | GTM | ☐ | ■ | ☐ | NZL | ☐ | ■ | ☐ |
| ARM | ■ | ■ | ☐ | GUY | ☐ | ☐ | ☐ | OMN | ☐ | ☐ | ☐ |
| AUS | ☐ | ■ | ■ | HKG | ☐ | ☐ | ☐ | PAK | ■ | ■ | ■ |
| AUT | ☐ | ■ | ■ | HND | ☐ | ■ | ☐ | PAN | ☐ | ■ | ☐ |
| AZE | ☐ | ■ | ■ | HRV | ☐ | ☐ | ☐ | PER | ☐ | ■ | ☐ |
| BDI | ☐ | ☐ | ☐ | HTI | ☐ | ☐ | ☐ | PHL | ■ | ■ | ☐ |
| BEL | ☐ | ■ | ■ | HUN | ☐ | ■ | ☐ | POL | ☐ | ■ | ■ |
| BEN | ■ | ☐ | ☐ | IDN | ■ | ■ | ■ | PRI | ☐ | ☐ | ☐ |
| BFA | ■ | ☐ | ☐ | IND | ■ | ■ | ■ | PRK | ☐ | ☐ | ☐ |
| BGD | ■ | ■ | ☐ | IRL | ☐ | ■ | ■ | PRT | ☐ | ■ | ☐ |
| BGR | ☐ | ■ | ■ | IRN | ☐ | ■ | ■ | PRY | ☐ | ■ | ☐ |
| BHR | ☐ | ■ | ■ | ISL | ☐ | ■ | ☐ | QAT | ☐ | ■ | ■ |
| BIH | ☐ | ■ | ■ | ISR | ☐ | ■ | ☐ | ROM | ☐ | ■ | ☐ |
| BLR | ☐ | ■ | ☐ | ITA | ☐ | ☐ | ☐ | RUS | ☐ | ■ | ■ |
| BLZ | ☐ | ■ | ☐ | JAM | ☐ | ☐ | ☐ | RWA | ■ | ■ | ☐ |
| BOL | ☐ | ■ | ☐ | JOR | ■ | ■ | ■ | SAU | ☐ | ■ | ■ |
| BRA | ☐ | ■ | ☐ | JPN | ☐ | ■ | ☐ | SDN | ☐ | ☐ | ■ |
| BTN | ☐ | ■ | ☐ | KAZ | ■ | ■ | ■ | SEN | ■ | ☐ | ☐ |
| BWA | ☐ | ■ | ☐ | KEN | ☐ | ☐ | ■ | SGP | ☐ | ■ | ☐ |
| CAF | ☐ | ☐ | ☐ | KGZ | ■ | ■ | ■ | SLE | ■ | ☐ | ☐ |
| CAN | ☐ | ■ | ■ | KHM | ■ | ■ | ☐ | SLV | ☐ | ■ | ☐ |
| CHE | ☐ | ■ | ■ | KOR | ☐ | ■ | ☐ | SOM | ☐ | ☐ | ■ |
| CHL | ■ | ■ | ☐ | KSV | ■ | ■ | ■ | SRB | ■ | ■ | ■ |
| CHN | ■ | ☐ | ■ | KWT | ☐ | ■ | ■ | SSD | ☐ | ☐ | ☐ |
| CIV | ■ | ☐ | ☐ | LAO | ☐ | ■ | ☐ | SUR | ☐ | ☐ | ☐ |
| CMR | ■ | ☐ | ■ | LBN | ■ | ■ | ■ | SVK | ☐ | ■ | ☐ |
| COG | ☐ | ☐ | ☐ | LBR | ■ | ■ | ☐ | SVN | ☐ | ■ | ☐ |
| COL | ☐ | ■ | ☐ | LBY | ☐ | ☐ | ■ | SWE | ☐ | ■ | ■ |
| COM | ■ | ☐ | ☐ | LKA | ■ | ■ | ☐ | SWZ | ☐ | ☐ | ☐ |
| CRI | ☐ | ■ | ☐ | LSO | ☐ | ☐ | ☐ | TCO | ■ | ☐ | ☐ |
| CUB | ☐ | ■ | ☐ | LTU | ☐ | ■ | ☐ | TGO | ■ | ■ | ☐ |
| CYP | ☐ | ■ | ☐ | LUX | ☐ | ■ | ☐ | THA | ■ | ■ | ☐ |
| CZE | ☐ | ■ | ☐ | LVA | ☐ | ■ | ☐ | TJK | ■ | ☐ | ■ |
| DEU | ☐ | ■ | ■ | MAR | ☐ | ■ | ■ | TKM | ☐ | ☐ | ■ |
| DJI | ■ | ☐ | ☐ | MDA | ☐ | ■ | ☐ | TTO | ☐ | ■ | ■ |
| DNK | ☐ | ■ | ■ | MDG | ■ | ■ | ☐ | TUN | ☐ | ■ | ■ |
| DOM | ☐ | ■ | ☐ | MEX | ☐ | ■ | ☐ | TUR | ☐ | ■ | ■ |
| DZA | ☐ | ■ | ■ | MKD | ☐ | ■ | ■ | TZA | ■ | ■ | ☐ |
| ECU | ☐ | ■ | ☐ | MLI | ■ | ☐ | ☐ | UGA | ■ | ■ | ☐ |
| EGY | ☐ | ■ | ■ | MLT | ☐ | ■ | ☐ | UKR | ■ | ■ | ■ |
| ERI | ☐ | ☐ | ☐ | MMR | ☐ | ■ | ☐ | URY | ■ | ■ | ☐ |
| ESP | ☐ | ■ | ■ | MNE | ■ | ■ | ☐ | USA | ■ | ■ | ■ |
| EST | ☐ | ■ | ☐ | MNG | ☐ | ■ | ☐ | UZB | ☐ | ☐ | ■ |
| ETH | ■ | ■ | ☐ | MOZ | ■ | ■ | ☐ | VEN | ☐ | ■ | ☐ |
| FIN | ☐ | ■ | ☐ | MRT | ■ | ☐ | ■ | VNM | ■ | ■ | ☐ |
| FRA | ☐ | ■ | ■ | MUS | ■ | ■ | ☐ | WBG | ☐ | ■ | ■ |
| GAB | ☐ | ☐ | ☐ | MWI | ■ | ■ | ☐ | YEM | ☐ | ■ | ■ |
| GBR | ☐ | ■ | ■ | MYS | ☐ | ■ | ■ | ZAF | ■ | ■ | ☐ |
| GEO | ■ | ■ | ■ | NAM | ☐ | ■ | ☐ | ZAR | ■ | ☐ | ☐ |
| GHA | ■ | ☐ | ☐ | NER | ■ | ☐ | ☐ | ZMB | ☐ | ☐ | ☐ |
| GIN | ■ | ☐ | ☐ | NGA | ■ | ☐ | ☐ | ZWE | ☐ | ☐ | ☐ |

Note: This table reports for each country whether the wage and unemployment data by education category are available, and whether the country has at least one Daesh recruit (solid markers). This table is discussed in Section 2.2.

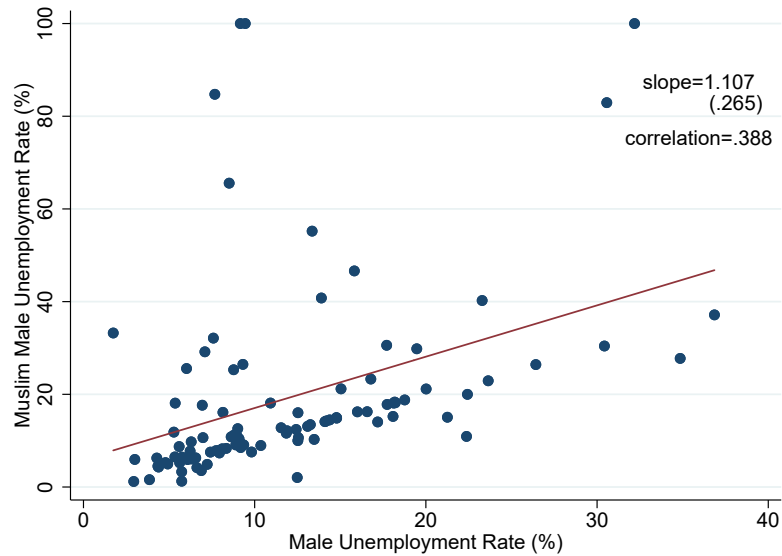
Figure A1: Marginal Effect of Unemployment on Daesh Recruitment by Quartiles



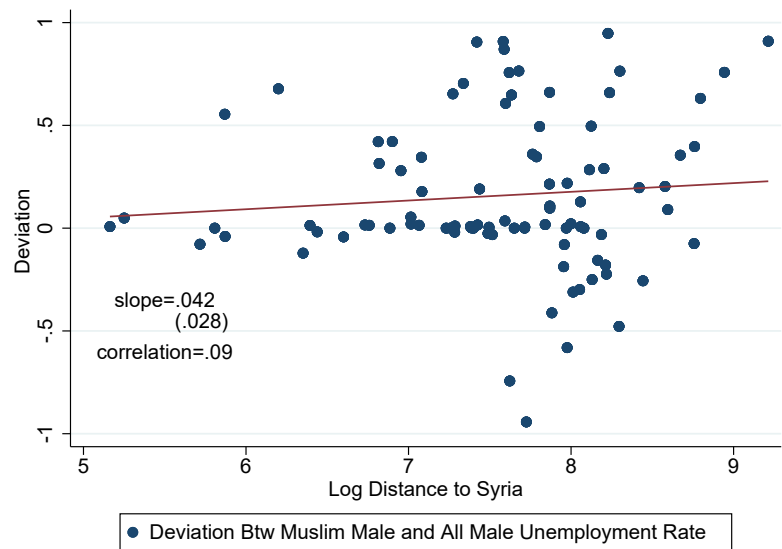
Note: This figures displays the coefficients on the unemployment*distance-quartile interaction, and their 95% confidence intervals, from the estimation in Table 5, column 4. This figure is discussed in Section 4.2.

Figure A2: Comparing Different Unemployment Measures

A: General Unemployment versus Muslim Unemployment

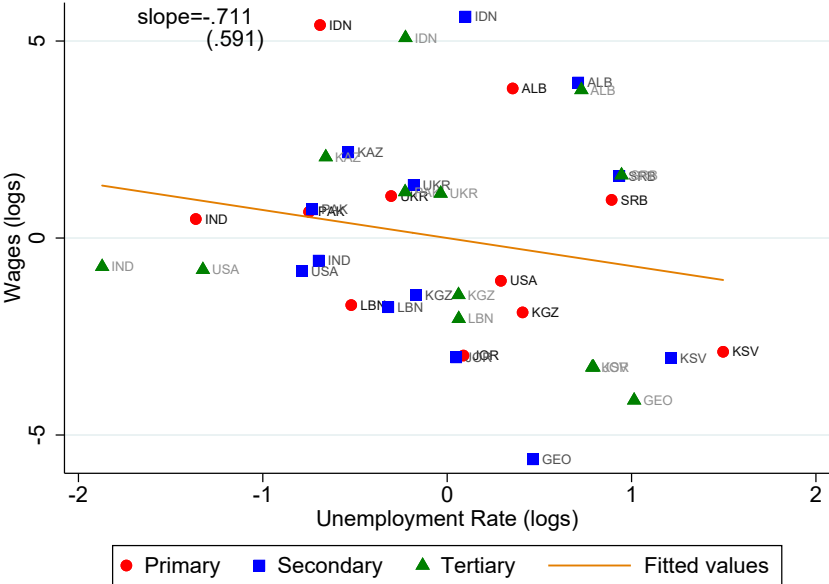


B: Deviation Between General and Muslim Unemployment by Distance



Note: Panel A displays the correlation between Muslim male unemployment and the general unemployment rate, in the Gallup survey data, for countries with a non-zero unemployment rate. Panel B shows that the deviation between these two unemployment measures is largely uncorrelated with distance to Syria. The deviation is calculated as $(\text{Muslim Male Unemployment Rate} - \text{General Male Unemployment Rate}) / (\text{Muslim Male Unemployment Rate})$. This figure is discussed in Section 4.3.1.

Figure A3: Wage and Unemployment Correlation



Note: This figures displays the scatter plot of log wages and log unemployment rates, after country and education-level fixed effects are partialled out. The sample includes countries that have at least one Daesh recruit and available wage and unemployment information. This figure is discussed in Sections 2.2 and 4.3.4.