

# Transnational Terrorist Recruitment

## Evidence from Daesh Personnel Records

*Anne Brockmeyer*

*Quy-Toan Do*

*Clément Joubert*

*Mohamed Abdel Jelil*

*Kartika Bhatia*



**WORLD BANK GROUP**

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## Abstract

Global terrorist organizations attract radicalized individuals across borders and constitute a threat for both sending and receiving countries. The paper provides plausibly-identified evidence on the drivers of transnational terrorist recruitment. Using unique personnel records from the Islamic State in Iraq and the Levant (ISIL, a.k.a. Daesh), it shows how economic

opportunities and migration costs interact to explain the spatial pattern of foreign participation in the terrorist group. Poor labor market opportunities generally push more individuals to join Daesh, but they hamper recruitment in countries far away from the organization's headquarters, as migration costs are large and liquidity constraints may bind.

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# Transnational Terrorist Recruitment: Evidence from Daesh Personnel Records\*

Anne Brockmeyer, Quy-Toan Do, Clément Joubert,  
Mohamed Abdel Jelil, and Kartika Bhatia<sup>†</sup>

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<sup>†</sup>Macroeconomics, Trade & Investment Global Practice (World Bank) and Institute for Fiscal Studies; Research Department (World Bank); Research Department (World Bank); Human Development Unit (World Bank); ASPIRE India, respectively.

# 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.<sup>1</sup> 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 also come from a more diverse set of countries than in previous wars. United Nations (2017) reports that, by May 2015, Daesh had 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 transnational terrorist recruitment is scarce.<sup>2</sup> In contrast, domestic terrorism has been the subject of more extensive research, as recently reviewed by Gaibulloev and Sandler (2019). Berman and Laitin (2008) contend that modern religious terrorist groups rely on their ability to limit their recruits' outside economic opportunities, in contrast to the ideologically-motivated left-wing or nationalist groups of the past. Empirically, however, evidence on the effect of economic opportunities on terrorism is mixed.<sup>3</sup> Bandyopadhyay and Younas (2011) and Enders and Hoover (2012) further observe that domestic and transnational terrorism may respond differently to local economic conditions.<sup>4</sup> For instance, engaging in domestic terrorism can be a part-time occupation and does not require the recruit to travel long distances. By contrast, joining an international terror group involves migration costs in addition to

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<sup>1</sup>ISIL, a.k.a. ISIS or Daesh, its Arabic acronym.

<sup>2</sup>Existing studies have investigated the ideological motivations of foreign recruits (Hegghammer 2010) or analyzed the process of radicalization and recruitment at the individual level (Weggemans, Bakker and Grol 2014, Gates and Podder 2015, Holman 2016). These case studies have gathered invaluable insights into the motivations of foreign fighters through interviews with the fighters and their contacts, yet they do not attempt a quantitative assessment of the drivers of recruitment.

<sup>3</sup>See 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, Hoover and Sandler (2016).

<sup>4</sup>These studies present separate cross-country correlations for the two phenomena, but do not delve into the mechanisms that could distinguish them.

forgoing earning opportunities at home, a combination of mechanisms that has received little attention in the literature on terrorism.

This paper exploits a unique data set of Daesh's personnel records to study how economic opportunities and migration costs interact to explain 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, Milton and Ressler (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, a first-order measure of economic opportunity costs.

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 2019). 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 participation that are informed by a new data source and a different identification strategy than in the previous literature.<sup>5</sup>

Theoretically, unemployment has an ambiguous effect on foreign terrorist 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, Collier and Hoeffler 1998, Blattman and Miguel 2010). On the other hand,

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<sup>5</sup>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.

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. 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 available estimates of 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 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. Therefore, 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.

The spatial heterogeneity in the effect of unemployment on recruitment is robust to a large number of alternative specifications, allowing us to discard competing interpretations. First, we show that the results 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. Second, we use data on domestic terrorism across the world to show that the availability of domestic terrorism opportunities is unlikely to explain our results. Third, we show that the heterogeneous effect of unemployment at different distance levels is not explained by country-level factors that would be correlated with migration costs. The distance-unemployment interaction in our regression dominates competing interactions between unemployment and GDP per capita, the share of the Muslim population, or regional dummies. Therefore, we conclude that the variation in migration costs between countries of origin and the headquarters of the terrorist organization is a credible driver of the spatial heterogeneity of the effect of unemployment on

recruitment.

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 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, Justino and Brück 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, Gawande and Kapur 2017),

or insurgents in Afghanistan, Iraq, or Pakistan (Guardado and Pennings 2019).<sup>6</sup>

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 and section 4 presents the two main results and 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.. The latter 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 allegiance to the organization. The records include information on a recruit's country of

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<sup>6</sup>Berman, Callen, Felter and Shapiro (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 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.



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.<sup>7</sup> 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 B1 and B2. Table B1 uses a dummy outcome indicating if any recruit is coming from a given country, and Table B2 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 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

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<sup>7</sup>Their 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.

or education, we are left with a sample of 2,987 recruits originating from 59 countries.<sup>8</sup>

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 B1 and B2, 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 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

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<sup>8</sup>We do not include the 32 recruits from Iraq and 43 from Syria.

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 Gaibullov 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.<sup>9</sup>

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 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.<sup>10</sup>

Augmenting the data with observations from 109 countries that do not supply Daesh

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<sup>9</sup>To 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.

<sup>10</sup>One limitation is due to recent unemployment and wage rate information not being available for all countries. Table B9 in the Appendix 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 Appendix Figure B1. 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.

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 Appendix Section A.

### 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 we believe is an improvement on the existing cross-country analyses of the economic drivers of terrorism. Second, 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  $e$ ,  $\mu_c$  and  $\gamma_e$  represent fixed effects for each country and the three education-level categories;  $\beta$  captures the conditional association of the unemployment

rate specific to a country-education cell with the number of Daesh recruits<sup>11</sup>; and  $\epsilon_{ce}$  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  $\alpha$  meanwhile absorbs 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 (Ozden, Wagner and Packard 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.<sup>12</sup>

The liquidity-constraint channel should be stronger for potential recruits from coun-

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<sup>11</sup>To the extent that psychological and political grievances co-vary with the unemployment rate across education categories, their effect would also be captured by  $\beta$ .

<sup>12</sup>Previous studies have highlighted other mechanisms which may offset the positive effect of unemployment on participation in terrorism. Most importantly, Berman, Shapiro and Felter (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.

tries 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 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  $\delta$  on the interaction term between distance and unemployment is negative. The relative size of  $\delta$  compared to  $\beta$  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 then 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. In section 4.3, we present a battery of robustness tests to show that the distance interaction indeed captures the strength of the liquidity constraints mechanism rather than other country characteristics correlated with distance.

## 4 Results

### 4.1 Unemployment and the Opportunity Cost of Joining Daesh

To test the theoretical prediction of a positive correlation between unemployment and Daesh recruitment due to the opportunity-cost channel, we first shut down the liquidity-constraint channel 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 indeed document the 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.<sup>13</sup> 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 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. This semi-elasticity of recruitment with respect to the unemployment rate 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) estimate 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. Thus, 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.<sup>14</sup>

To anticipate the coming analysis for the full sample, 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

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<sup>13</sup>Since 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).

<sup>14</sup>The average unemployment rate in that set of countries is 9.6 percent.

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 the next section.

## 4.2 Spatial Heterogeneity in the Unemployment-Terrorism Relationship

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. Theoretically therefore, the effect of unemployment on Daesh enrollment should decrease as distance to Iraq and Syria increases; the relationship can potentially change sign if the effect of more stringent liquidity constraints dominates the effect of lower opportunity costs of participation.

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

Figure 3 graphically illustrates our main result. 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 countries such as Egypt and Saudi Arabia in Panel A.

The regression results are presented in Table 5. 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.<sup>15</sup> Bootstrapped standard errors yield similar results (Table B3). Thus, unemployment is a push factor for Daesh recruitment in countries close to Iraq and Syria, but becomes an impediment to recruitment in distant countries.

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 B4 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 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.

Finally, we show that we obtain our main result also 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

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<sup>15</sup>The results from this regression are visualized in Figure B3, which plots the point estimates  $\beta$  with the 95 percent confidence interval.

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 point estimates and the levels of significance differ, but the 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 for all three roles and for the whole sample. For fighters, the effect of unemployment is relatively lower than for the other categories, while it is higher for suicide fighters. The point estimates for administrators are not significant (the number of observations is markedly lower, leading to large standard errors), but very similar to those obtained for the full sample.

Our findings highlight the two opposing effects of unemployment on the international recruitment of jihadists. On the one hand, unemployment means lower foregone earnings upon joining Daesh. On the other hand, unemployed candidates in distant countries find it harder to mobilize the financial resources for long-distance travel to reach the terrorist organization. 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.

We thus consider whether the availability of domestic terrorist opportunities could explain part of our results, i.e. explain the negative distance-unemployment interaction. 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)<sup>16</sup>,  $\mu_c$  and  $\rho_t$  are country and year fixed effects,  $Post$  indicates the years after Daesh emergence, and the unemployment rate is measured at the country-year level. 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 [B5](#) 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 [B6](#) 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.

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

### 4.3 Robustness Tests

This section presents a number of robustness tests. First, we show that our main results are not driven by one or two influential countries. To do so, 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.

We then refute 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 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 B2 shows that the Muslim unemployment rate (as measured by Gallup survey data) is strongly correlated with the general unemployment rate.<sup>17</sup> 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.

Third, and crucially, our results are not driven exclusively by Muslim-majority countries, as we demonstrate in Table 6. 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

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

that the coefficients in all specifications are identical.<sup>18</sup> 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.

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 B1 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 7 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 7. 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 standard 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 differ-

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<sup>18</sup>A similar result holds if we instead restrict to countries such that Muslims account for at least 1 percent of their entire population. There are 41 such countries in our sample.

ence 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.

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 6, 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 B4 are also robust to censoring concerns, as the Poisson uses all country-education cells in countries with at least one fighter.

Lastly, we show in Table B7, 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.<sup>19</sup>

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<sup>19</sup>We prefer these geographic measures to alternative distance measures such as the cost of a flight ticket,

We now turn to concerns that geographical distance might stand in for other country characteristics, which are correlated with distance, and which mediate the effect of unemployment on Daesh recruitment. For example, geographically more distant countries, such as OECD countries, 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 and less relevant.

Note first that these alternative stories 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 specifically rule out those distance confounders that we can measure. In Tables 8 and 9, 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

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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.

main effect.<sup>20</sup>

## 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 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.

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<sup>20</sup>To conduct a more systematic analysis of potential regional differences in our main effect, we show in Table B8 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.





## 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 Appendix A.

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 Appendix A.

Table 2: Summary Statistics of Fighter Characteristics

<b>Fighter Characteristics</b>	<b>Mean</b> (%)	<b>Std. Error</b> (%)	<b>N</b> (#)
<b>Age</b>			
< = 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
<b>Education</b>			
Primary	17.7	0.7	2,827
Secondary	51.7	0.9	2,827
Tertiary	30.6	0.9	2,827
<b>Religiosity Level</b>			
Low	68.7	0.9	2,634
Medium	26.2	0.9	2,634
High	5.1	0.4	2,634
<b>Previous Occupation</b>			
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
<b>Jihad Experience</b>			
	11.0	0.6	3,121
<b>Desired Role</b>			
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.

Table 3: Descriptive Statistics of Macroeconomic Variables

<b>Panel A: Country Level</b>					
<b>Variable</b>	<b>Mean</b>	<b>St. Dev</b>	<b>Min</b>	<b>Max</b>	<b>N</b>
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
<b>Panel B: Country-Education Level</b>					
<b>Variable</b>	<b>Mean</b>	<b>St. Dev</b>	<b>Min</b>	<b>Max</b>	<b>N</b>
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 in Appendix A. The relative wage is normalized to 1 for tertiary education.

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  $\leq 40$  using Moulton correction factor. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent level, respectively.

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

VARIABLES	(1) <i>logN<sub>ce</sub></i> Total	(2) <i>logN<sub>ce</sub></i> Total	(3) <i>logN<sub>ce</sub></i> Total	(4) <i>logN<sub>ce</sub></i> Total	(5) <i>logNF<sub>ce</sub></i>	(6) <i>logNS<sub>ce</sub></i>	(7) <i>logNA<sub>ce</sub></i>
Unemployment rate	0.668*** (0.140)				0.069** (0.031)	0.027 (0.058)	0.084 (0.069)
Total Labor force (log)	-0.000 (0.082)	0.027 (0.087)	0.030 (0.089)	-0.063 (0.075)	0.515*** (0.184)	0.479 (0.328)	0.321 (0.686)
<b>Interaction between unemployment and</b>							
Distance to Syria (log)	-0.091*** (0.020)						
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<sub>ce</sub></i>	25.4	25.4	25.4	25.4	x	x	x
Mean <i>NF<sub>ce</sub></i>	x	x	x	x	7.9	x	x
Mean <i>NS<sub>ce</sub></i>	x	x	x	x	x	7.5	x
Mean <i>NA<sub>ce</sub></i>	x	x	x	x	x	x	2.8
Number of countries	44	44	44	44	32	24	13
Country FE	Y	Y	Y	Y	Y	Y	Y
Education Dummies	Y	Y	Y	Y	Y	Y	Y
Adj. R-squared	.83	.81	.84	.85	.76	.45	.3

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  $\leq 40$  using Moulton correction factor. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent level, respectively.

Table 6: Determinants of Foreign Enrollment in Daesh - Robustness Across Sub-Samples

VARIABLES	(1) $\log N_{ce}$ $N_c >= 33$	(2) $\log N_{ce}$ $N_c >= 10$	(3) $\log N_{ce}$ $N_c >= 0$	(4) $\log N_{ce}$	(5) $\log N_{ce}$	(6) $\log N_{ce}$	(7) $\log N_{ce}$
<b>Main effects</b>							
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)
<b>Interaction between unemployment and</b>							
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	0.732	0.793	0.838	0.841	0.744	0.746	0.833

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. Standard errors in parentheses, clustered at the country level and corrected for small number of clusters whenever number of clusters  $\leq 40$  using Moulton correction factor. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent level, respectively.



Table 7: Determinants of Foreign Enrollment in Daesh - Robustness to Wage Controls

VARIABLES	(1) <i>logN<sub>ce</sub></i>	(2) <i>logN<sub>ce</sub></i>	(3) <i>logN<sub>ce</sub></i>	(4) <i>logN<sub>ce</sub></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)
<b>Interaction between unemployment and</b>				
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<sub>ce</sub></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  $\leq 40$  using Moulton correction factor. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent level, respectively.

Table 8: 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)
<b>Interaction between unemployment and</b>							
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  $\leq 40$  using Moulton correction factor. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent level, respectively.

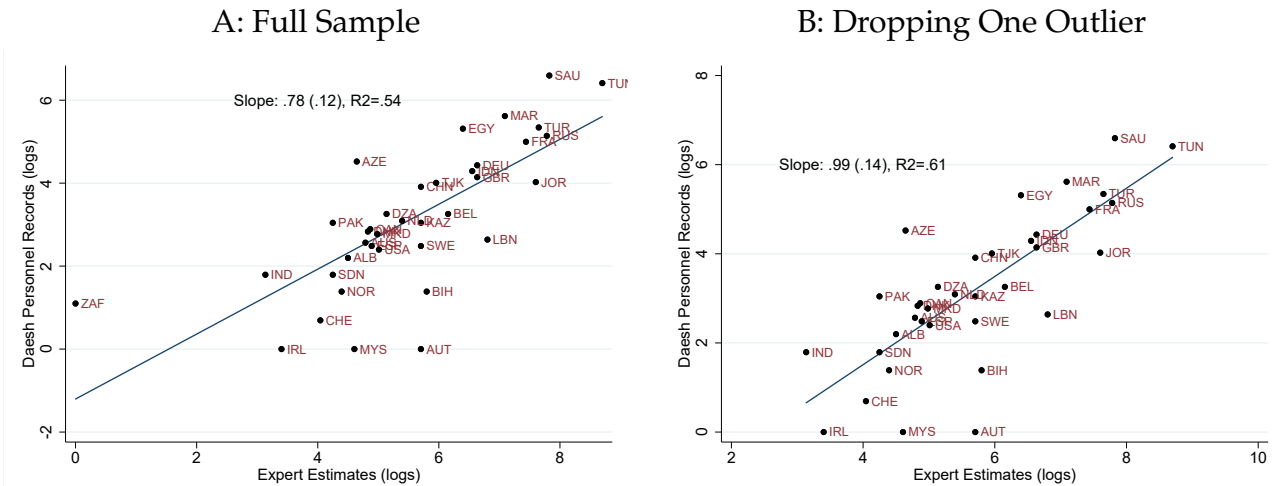
Table 9: Determinants of Foreign Enrollment in Daesh - Robustness of Distance Interaction (2/2)

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)
<b>Interaction between unemployment and</b>							
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  $\leq 40$  using Moulton correction factor. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent level, respectively.

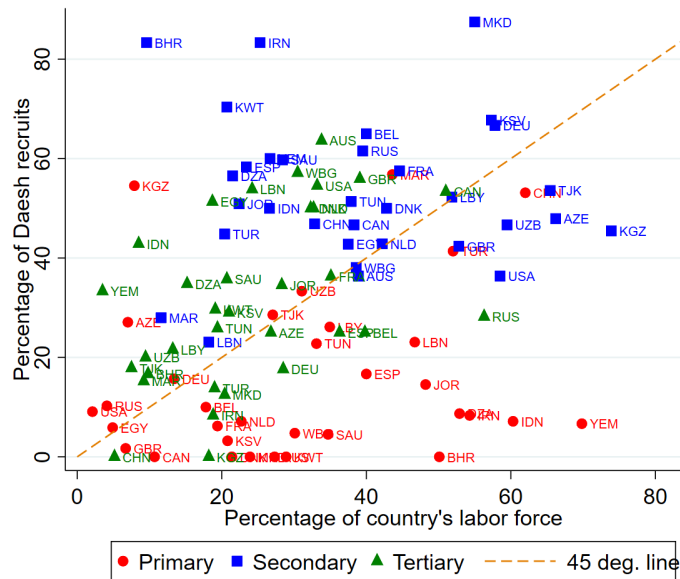
## 7 Figures

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.

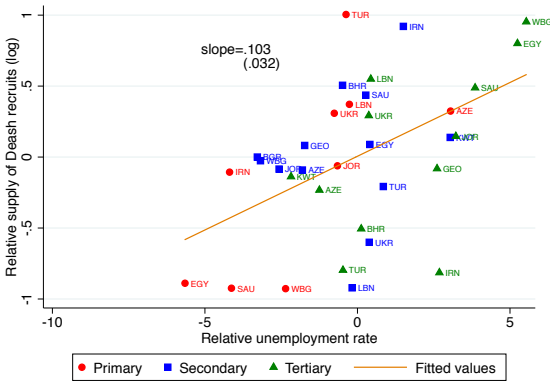
Figure 2: Schooling Attainment Among Daesh Recruits Relative to their Country of Last Residence



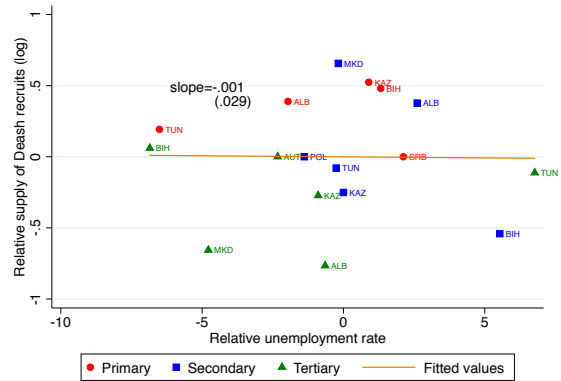
Note: This figure plots, for each country and education category, the share of individuals that obtained the relevant education level, in the country's general labor force and among the recruits appearing in our Daesh personnel records. To obtain stable shares, we focus on countries with more than 10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

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

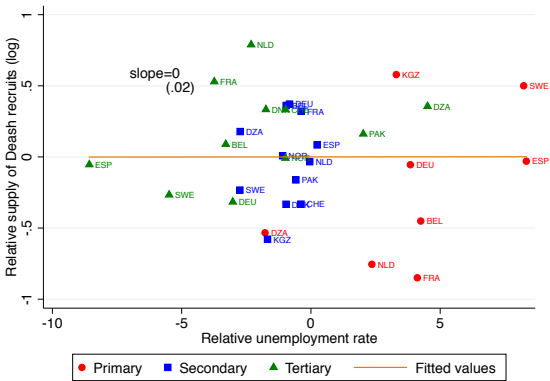
(a) Countries in Distance Quartile 1



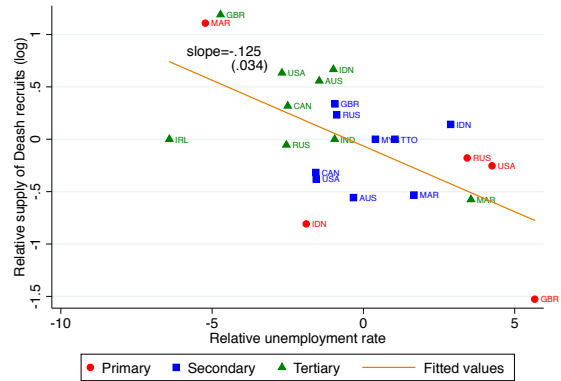
(b) Countries in Distance Quartile 2



(c) Countries in Distance Quartile 3

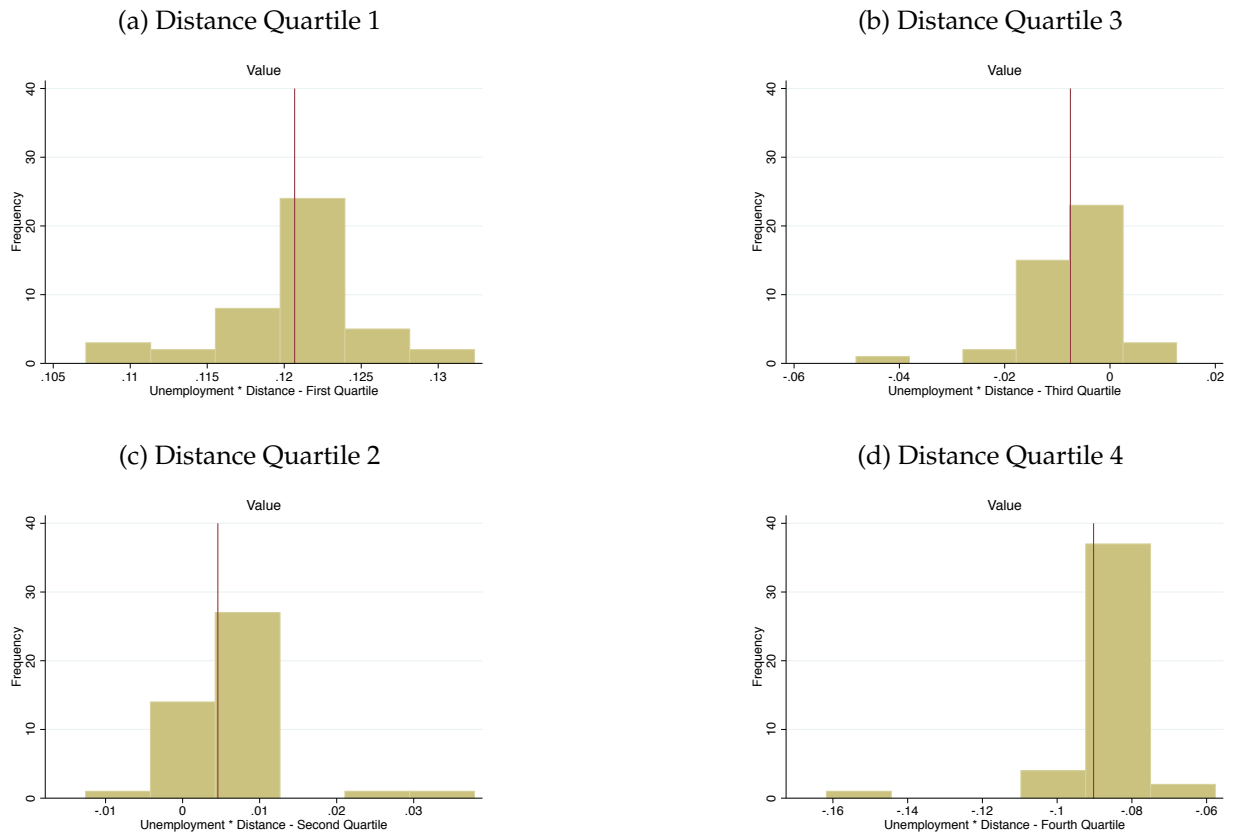


(d) Countries in Distance Quartile 4



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.

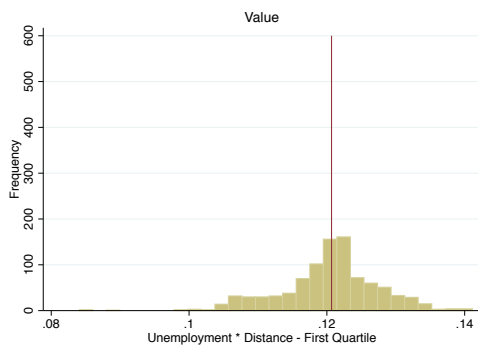
Figure 4: Distribution of Main Effect Estimates (1/2)



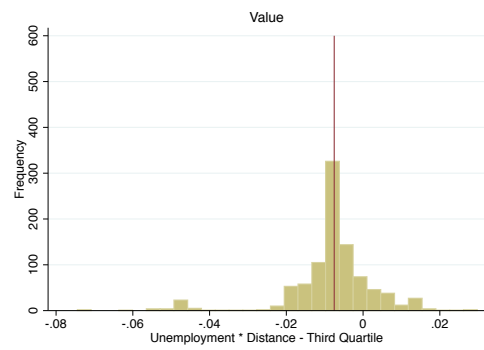
Note: These figures plot the distribution of point estimates  $\beta_i$  on the unemployment\*distance-quartile interaction term, from the regression  $\ln N_{ce} = \alpha + \mu_c + \gamma_e + \sum_i \beta_i \ln U_{ce.quartile_i} + \ln LF_{ce} + \epsilon_{ce}$ , where we re-estimate the model 44 times,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

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

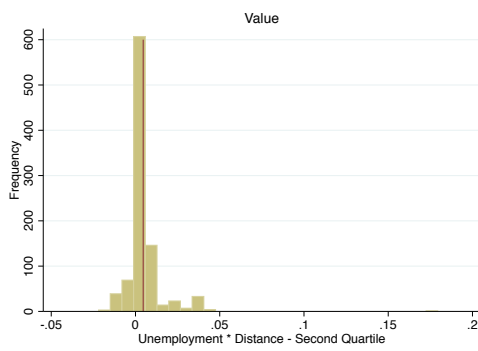
(a) Distance Quartile 1



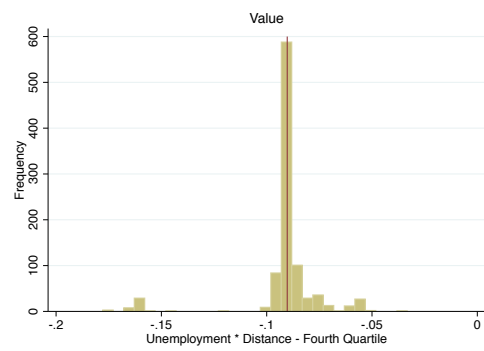
(b) Distance Quartile 3



(c) Distance Quartile 2



(d) Distance Quartile 4



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



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## A Variable definitions

Variable name	Description	Source
<b>Country-Education level Variables</b>		
<b>LogN<sub>ce</sub></b>	Log of number of Daesh recruits from country $c$ by education categories: No education/Primary, Secondary and Tertiary level. Authors calculation.	Daesh personnel records
<b>LogNF<sub>ce</sub></b>	Log of number of Daesh recruits who aspire to be fighters from country $c$ by education categories: No education/Primary, Secondary and Tertiary level. Authors calculation.	Daesh personnel records
<b>LogNS<sub>ce</sub></b>	Log of number of Daesh recruits who aspire to be suicide fighters from country $c$ by education categories: No education/Primary, Secondary and Tertiary level. Authors calculation.	Daesh personnel records
<b>LogNA<sub>ce</sub></b>	Log of number of Daesh recruits who aspire to be administrators from country $c$ by education categories: No education/Primary, Secondary and Tertiary level. Authors calculation.	Daesh personnel records
<b>Unemployment rate</b>	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
<b>Total Labor force (log)</b>	Log of sum of the number of persons employed and the number of persons unemployed.	ILOSTAT
<b>Median wage (log)</b>	Median wage for men of all age groups and men aged 18-36	International Income Distribution Data Set (I2D2)
<b>Country level Variables</b>		
<b>1<sub>Nc &gt; 1</sub></b>	Dummy variable which is one when a country sends at least one Daesh recruit and zero otherwise.	Daesh personnel records
<b>Distance to Syria (log)</b>	Log of air (flying) distance between centroid of a country and centroid of Syria in miles.	DistanceCalculator.net
<b>Per capita GDP (log)</b>	Log of Gross Domestic Product divided by midyear population. Data are in current U.S. dollars.	The World Bank Database
<b>Muslim Population (log)</b>	Log of Muslim population in a country divided by (1+1000000). Year: 2010.	Pew Research Center's The future of global Muslim population, January 2011
<b>Total Population (log)</b>	Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The values are midyear estimates and are logged.	The World Bank Database

<b>Human Development Index</b>	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
<b>Index of political rights</b>	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
<b>Corruption Index</b>	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
<b>Ethnic fractionalization</b>	Reflects probability that two randomly selected people from a given country will not belong to the same ethnic group. The higher the number, the more fractionalized society.	Alesina et al., 2003
<b>Linguistic fractionalization</b>	Reflects probability that two randomly selected people from a given country will not belong to the same linguistic group. The higher the number, the more fractionalized society.	Alesina et al., 2003
<b>Religious fractionalization</b>	Reflects probability that two randomly selected people from a given country will not belong to the same religious group. The higher the number, the more fractionalized society.	Alesina et al., 2003
<b>Average religiosity (self-reported)</b>	Proportion of people who agree that religion is an important part of their daily life.	Gallup World Poll
<b>Government Restrictions Index</b>	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
<b>Social Hostilities Index</b>	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

## **B Supplementary Tables and Figures**



Table B1: 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.

Table B2: 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)	
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)	
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)	
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)	
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)	
Per capita GDP (log)	0.395*** (0.064)		0.446*** (0.095)		0.059 (0.097)				0.736*** (0.104)		0.623*** (0.148)		0.087 (0.175)			
Human Development Index							1.203 (1.126)								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)	
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)	
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)	
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)	
Observations	160		148		148		147		160		148		148		147	
Adjusted R-squared	0.456		0.497		0.593		0.594		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	
Region FE	N		N		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.

Table B3: Determinants of Foreign Enrollment in Daesh - Bootstrapped Std. Errors

VARIABLES	(1) <i>logN<sub>ce</sub></i> Total
Total Labor force (log)	-0.063 (0.108)
<b>Interaction between unemployment and</b>	
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.

Table B4: 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)
<b>Interaction between unemployment and</b>				
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  $\leq 40$  using Moulton correction factor. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent level, respectively.

Table B5: 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. 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.

Table B6: 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)			
<b>Interaction between unemployment and</b>						
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.

Table B7: 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)
<b>Interaction between unemployment and</b>													
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).

Table B8: Determinants of Foreign Enrollment in Daesh: 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)
<b>Interaction between unemployment and</b>						
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  $\leq 40$  using Moulton correction factor. \*\*\*, \*\*, and \* indicate statistical significance at the 1, 5, and 10 percent level, respectively.

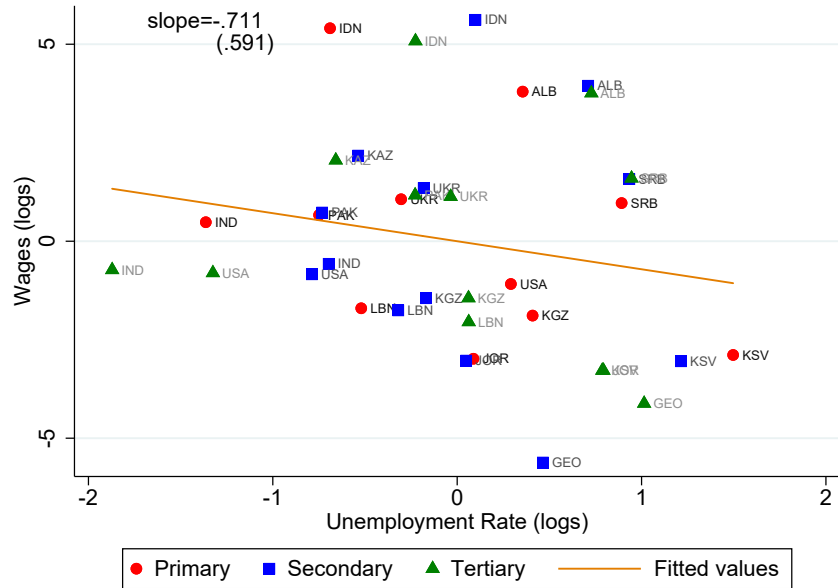


Table B9: Wages, Unemployment and Daesh Recruits Data Overlap

	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	□	□	□	TCD	■	□	□
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	□	□	□

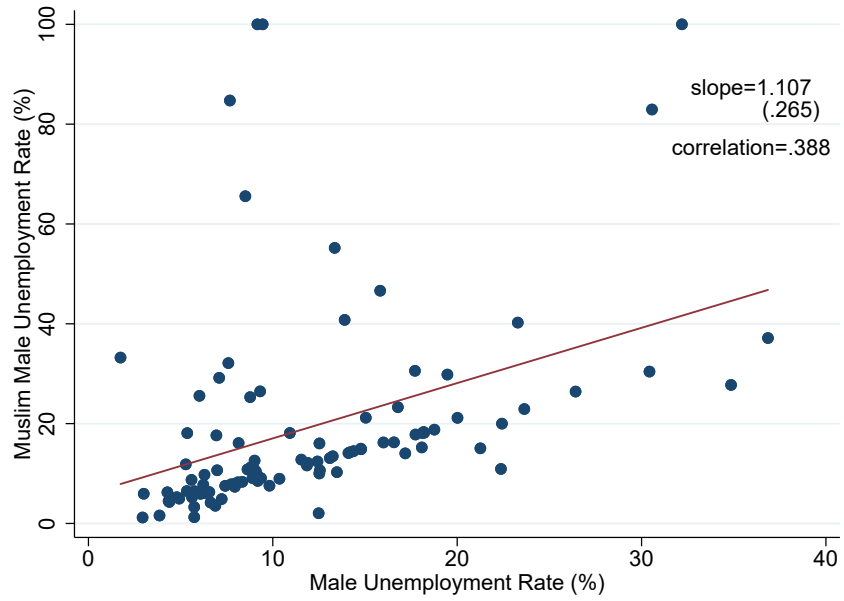
Note: This table reports for each country whether the wage and unemployment data by education category are available, and whether the country has at least one Daesh recruit (solid markers).

Figure B1: Wage and Unemployment Correlation



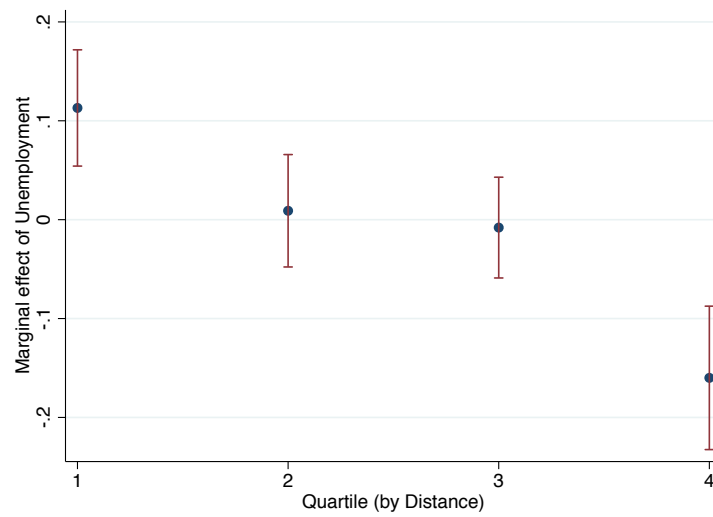
Note: This figure displays the scatter plot of log wages and log unemployment rates, after country and education-level fixed effects are partialled out. The sample includes countries that have at least one Daesh recruit and available wage and unemployment information.

Figure B2: General Unemployment versus Muslim Unemployment



Note: This figures 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.

Figure B3: 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.