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Benos, Nikos and Kammas, Pantelis

University of Ioannina, Athens University of Economics and Business

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Nikos Benos[a] and Pantelis Kammas[b]

[a] *Department of Economics, University of Ioannina, P.O. Box 1186, Ioannina 45110, Greece.*
nbenos@cc.uoi.gr

[b] *Athens University of Economics and Business, Patission 76, Athens 10434, Greece.*
kammas@aueb.gr

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Abstract: This paper advances the hypothesis that individuals in more ethnically fragmented societies, participate less in social groups. More precisely, the empirical analysis places the spotlight on trade unions and investigates whether ethnic diversity affects the decision of workers to participate in them. The analysis takes place along two layers:(a) cross-country and (b) individual level. First, building on a set of innovative instruments derived from the *parasite-stress theory of values and sociality*, our cross-country analysis seeks to exploit exogenous sources of variations in ethnic diversity and to establish a convincing relationship between ethnic diversity and trade union density across countries. In turn, by following an *epidemiological approach*, our analysis attempts investigate variations on the behavior of individuals whose social values potentially differ, but they all live in a common economic and institutional setting. To this end, we employ individual level data from the European Social Survey (ESS) and we investigate whether migrants that come from more ethnically fragmented societies participate less in trade unions in their European countries of residence. Consistent with the prediction of the theory, both layers of the empirical analysis provide evidence of a negative and highly significant relationship between ethnic diversity and the decision of the workers to participate in trade unions.

JEL: J51, J15, C21, C26

Keywords: trade unions, ethnic diversity, assortative sociality, parasites

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1. Introduction

It is widely accepted that ethnic diversity can have far reaching consequences for economic and political development within countries (see e.g., Alesina and La Ferrara, 2005; Alesina and Glaeser, 2004; Fearon and Laitin, 2003). Focusing on the provision of public goods, a large number of studies suggest that increased diversity reduces the amount of provided public goods both across countries and across communities within a country (see Alesina and La Ferrara, 2005; Stichnoth and Van de Straeten, 2009 for reviews of this literature). The cornerstone of this widely observed fact, is that individuals are less willing to provide a good with public benefits if those benefits are directed to groups that share different racial, ethnic and linguistic characteristics.[1]

Following a similar rationale, Alesina and La Ferrara (2000) investigate whether the participation of individuals in social groups is affected by the fact that a population may be heterogeneous in terms of race or ethnicity. Using survey data on group memberships from US localities, they suggest that participation in civil activities is significantly lower in more ethnically fragmented societies. These findings come as no surprise. According to Olson (1965) collective action presents public goods' characteristics (i.e. each individual has an incentive to "free ride" on the efforts of the others if the collective action aims to provide non-excludable benefits to everybody). Thus, the effect of increased ethnic diversity on the participation in social groups is expected to be qualitatively similar to the effect of increased ethnic diversity on the provision of any type of public goods.

The paper at hand places the spotlight on a specific type of social group (namely, trade unions) and investigates whether workers participate less in trade unions in ethnically fragmented societies.[2] This hypothesis dates back at least to Marx and Engels who first suggested that increased ethnic and racial diversity undermines class consciousness and weakens the unity of the working class in the United States.[3] More recently, Lipset and Marks (2000) investigated how increased racial antipathies within the US are interrelated with the so-called "American Exceptionalism" and the corresponding reduced participation of American workers in trade unions. It is worth noting that craft unions in the American Federation of Labor (AFL) were organized along ethnic lines, encompassing native workers and "old" immigrants from Northern Europe and largely excluding "new" immigrants from Southern and Eastern Europe, along with Chinese and African-Americans. Similarly, Davis (1988) argues that conflicts among ethnic groups were particularly intense in the US labor market during the early 19th century. Particularly, from the late 1830s, Irish immigrants entered the US labor market, which was formerly

[1] One potential explanation for this effect is that different groups have different preferences or agendas for public spending and that this disagreement makes the provision of public goods more costly in heterogeneous communities (see Alesina et al., 1999). An alternative explanation is that altruism travels less across racial and ethnic lines and members of one racial or ethnic group naturally dislike members of other groups. The literature documenting prejudice, discrimination and ethnic hate is vast. Classics include Allport (1954) on the psychology of racial prejudice, Becker (1957) on the economics of discrimination as well as DuBois (1903) and Gilens (1999) on race relations and racial stereotypes in the United States. A slightly more nuanced view is that racial hate is endogenous to the political system and it is often created by politicians in order to serve specific political purposes (see e.g., Glaeser, 2005).

[2] According to Olson (1965), participation in trade unions constitute a very standard type of collective action. This is because trade unions provide non-excludable benefits to every single worker (e.g., a wage increase) independently on whether he/she helped bearing the costs.

[3] The view that working-class ethnic and racial diversity undermined class consciousness and weakened the socialistic political movements in America was put forward in 1870 by Karl Marx, who emphasized that American socialists should press for a coalition among workers of different ethnic backgrounds (see the letter of Marx to S. Meyer and A. Vogt, April 9, 1870 in Karl Marx (1973) pp. 499-500). Similarly, Engels wrote a letter to Sorge, December 2, 1892, emphasizing that: "[…] the great obstacle in America, it seems to me, lies in the exceptional position of the native workers. […] The ordinary badly paid occupations are left to immigrants, of whom only a small section enters the aristocratic trade unions" (see Marx and Engels (1936)).

dominated by Germans, British and African- Americans. Irish workers were particularly successful partly because they were willing to work for lower wages than former immigrants (and even former slaves), and partly because the Irish had a strong sense of community that allowed them to exclude competing workers from other ethnic groups. Overall, the case of US labor market during the early 19th century provides striking anecdotal evidence that strong antipathies among workers belonging to different ethnic groups weaken their participation in trade unions.[4]

This research aims to investigate the relationship between ethnic diversity and participation in trade unions using both cross-country and individual level data. More precisely, the analysis takes place in two layers exploiting exogenous variations in ethnic diversity across: (a) countries and (b) migrants of different ancestry within a country. In the first part of the analysis relies on cross-country data from 91 developed and developing countries and investigates the effect of ethnic and religious diversity on trade union density. To address the usual endogeneity concerns driven by the fact that both ethnic diversity and trade union density may be endogenous to economic and political institutions, we instrument ethnic diversity on a set of innovative epidemiological data that have been linked empirically to ethnic and religious diversity (see e.g., Cashdan, 2001; Fincher and Thornhill, 2008; 2012; 2014). More precisely, we employ as instruments the: (i) *combined parasite stress*, (ii) *non-zoo parasite stress* developed by Fincher and Thornhill (2012) and (iii) *pathogen prevalence of infectious diseases* data developed by Fincher and Thornhill (2008).[5] Epidemiological data are neither economic nor political in nature, thus they ensure a sufficient source of exogenous variation for ethnic diversity.[6] Our empirical findings provide evidence of a negative, statistically significant and quantitatively important effect of ethnic diversity on trade union density, which remains robust across different specifications and estimation techniques.

In the second part, we re-examine the above-mentioned hypothesis by using individual data from the European Social Survey (ESS). More precisely, our analysis builds on a set of 6880 –first generation– migrants from 116 countries of origin who reside in 32 European countries and employs the so-called *epidemiological approach* suggested by Fernandez (2008, 2011) and employed by a large number of scholars in order to separate the culture from the environment (see e.g., Luttmer and Singhal (2011); Galor and Ozak, 2016). This part of the analysis explores the effect of ethnic diversity in the birth country of a –first generation– migrant on his/her decision to participate in a trade union in the country of residence. Individual data allows us to account for a number of personal characteristics (such as age, gender, education, type of employment etc) but most importantly to introduce residence country fixed effects that are able to account for institutional and cultural characteristics of

[4] In a parallel –albeit related- literature, focusing mainly on fiscal redistribution, Roemer (1998), Lee and Roemer (2006) and Roemer and Van der Straeten (2005; 2006) investigate the effect of adding a second dimension (such as race or religion) on the political conflict for redistribution. Their analysis suggests that the inclusion of a second racial dimension divides the group of agents that are in favor of redistribution (i.e., the relatively poor agents) and leads to a bundling effect that mitigates redistributive policies. This is because a share of the voters that are in favor of redistribution votes for a political party that advocates lower redistribution since they may agree with the party's agenda on ethnic and racial issues.

[5] Although many recent empirical studies employ pathogen prevalence of infectious diseases as instrument for culture (see e.g., Gorodnichenko and Roland, 2017; Gründler amd Köllner, 2020; Kammas et al., 2017; Nikolaev et al., 2017) to the best of our knowledge, there is no study that employs the same set of variables as an instrument for ethnic diversity. This is puzzling especially if one considers that the effect of biogeography on ethnolinguistic diversity appears to be well-established in the relevant literature (see e.g., Michalopoulos, 2012; Cashdan, 2001; Fincher and Thornhill, 2008; 2012; 2014)

the country of residence. Empirical findings suggest that the decision of a worker to participate in trade unions is affected negatively by increased ethnic diversity in his/her birth country. Once again, our empirical findings remain robust and qualitatively intact across different specifications.

The remainder of the paper proceeds along the following lines. Section 2 discusses the economic argument upon which we base our empirical analysis. Section 3illustrates the data and identification strategy. Section 4 presents the empirical findings. Finally, Section 5 concludes.

2. Literature and the economic argument

A number of studies on diversity investigate the relationship between ethnic fractionalization and the amount or distribution of public spending by governments or-more recently- on attitudes towards activities and goods that generate public benefits (see Alesina and La Ferrara, 2005; Stichnoth and Van de Straeten, 2011 for reviews of this literature). The main conclusion from this literature is that ethnically diverse communities spend less on social programs as a share of GDP (Alesina and Glaeser, 2004; Desmet et al., 2009), less on schools (Alesina et al., 2003, Goldin and Katz, 1999) and less on public infrastructure (Alesina et al., 2003; La Porta et al., 1999).

Moreover, the relevant literature suggests that increased ethnic diversity exerts a negative impact on individual attitudes and behavior when public benefits are involved. Specifically, in ethnically heterogeneous communities, individuals express a stronger preference for decreasing social benefits (Dahlberg et al., 2012), contribute less to community organizations (Otken and Osili, 2004), contribute less to schools through voluntary fundraising events (Miguel and Gugerty, 2005), are less likely to fill out census forms (Vidgor, 2004), donate less on private charities (Andreoni et al., 2016) and participate less on social groups (Alesina and La Ferrara, 2000). There are several explanations for this widely observed result. One potential explanation is that different groups have different preferences or agendas for public spending and that this disagreement makes the provision of public goods more costly in heterogeneous communities (see Alesina et al., 1999). An alternative explanation is that altruism travels less across racial and ethnic lines and members of one racial or ethnic group naturally dislike members of other groups. Moreover, there may be mistrust across groups (Alesina and La Ferrara, 2002; Fershtman and Gneezy, 2001) or pro-social group norms that are not easily enforceable across groups (Habyarimana et al., 2007).

Although there is much anecdotal evidence that strong ethnic antipathies among workers weaken their decision to participate in trade unions (see e.g., Lipset and Marks, 2000; Davis, 1988; Sombart, 1906), to the best of our knowledge the relationship between ethnic diversity and the participation in trade unions has not been investigated by the relevant literature. Since trade unions are also social groups that provide non-excludable benefits to every single worker (e.g., a wage increase) independently on whether he/she bearing the costs (see Olson, 1965), our analysis seeks to complement the relevant literature by placing the spotlight on this specific type of social group by investigating whether workers participate less in trade unions in ethnically fragmented societies.

3. Data and Empirical Strategy

Empirical analysis takes place in two layers exploiting exogenous variations in ethnic diversity across: (a) countries and (b) migrants from different countries within Europe.

3.1 Cross-Country analysis

In this part of the analysis, we rely on cross country data from 91 -developed and developing- countries and investigate the effect of ethnic and religious diversity on trade union density.

3.1.1. Data and Empirical Strategy

Two of the most well-established measures of ethnic fractionalization at the country level are those developed by: (i) Alesina *et al.* (2003) and (ii) Fearon (2003). The ethnic fractionalization measure developed by Alesina et al., (2003) [denoted as *Ethnic (Alesina)*] is an index reflecting the probability that two randomly selected individuals in a country's population belong to different ethnic groups. In other words, *Ethnic (Alesina)* equals to one minus the Herfindahl index of ethnic groups' shares, where the primary data on ethnic groups' shares are obtained by the *Atlas Narodov Mira,* carried out by a team of Soviet ethnographers in the early 1960s. Similarly, Fearon (2003) compiled an index of ethnic fractionalization [denoted as *Ethnic (Fearon)*] based on 822 different ethnic and "ethnoreligious" groups in 160 countries. The primary sources for this measure are the *CIA's World Factbook*, the *Encyclopedia Britannica* and, when possible, the relevant *Library of Congress Country Study*.[7] The analysis basically relies on these two alternative measures of ethnic fractionalization. However, in a battery of robustness checks we also employ: (i) the ethnic diversity measure developed by Montalvo and Reynal-Querol (2005) [denoted as *Ethnic (Montalvo)*], (ii) the total number of distinct ethnic groups in a country's population, as developed by Fearon (2003) [denoted as *Number of ethnic groups(Fearon)*], the number of major religions and ethno-religions per country compiled by Barrett et al. (2001) *World Christian Encyclopaedia* [denoted as *Religion Diversity (Barrett)*] and (iv) the religion fractionalization developed by Montalvo and Reynal-Querol (2005) [denoted as *Religion Fractionalization (Montalvo)*].

Concerning the trade union density proxies, we employ two alternative measures. The first one -which ensures the maximum number of observations- is the trade union density compiled by the International Labour Organization (ILO) in the *World Labour Report*, whereas the second is the trade union density measure developed by Botero et al. (2004). Both these variables capture union membership as a proportion of the eligible workforce (i.e. non-agricultural labor force) and can be employed as indicators of the degree to which workers are organized.

The analysis relies on contemporary measures of trade union density and ethnic diversity that can be endogenous to a number of economic and political institutions. To address these potential endogeneity and omitted variable concerns, we instrument ethnic diversity on a set of epidemiological data that have been linked empirically to ethnic and religious diversity (see e.g., Cashdan, 2001; Fincher and Thornhill, 2008). More precisely, we employ as instruments the: (i) *combined parasite stress* (ii) *non-zoo parasite stress* developed by

[7] See Fearon (2003) for additional details on primary data sources and methodological assumptions of what defines a separate ethnic group.

Fincher and Thornhill (2012) (iii) *pathogen prevalence of infectious diseases* developed by Fincher and Thornhill (2008).

Starting from McNeill (1974; 1980) and Diamond (1997), a large body of literature in social anthropology investigates how infectious diseases affect the structure of human communities and the cultural norms within communities across different times and places. More recently, a number of studies (see e.g., Fincher and Thornhill, 2014 for a review of this literature) place the spotlight on specific aspects of culture and investigate how infectious diseases affect the strength of family ties and religiosity (Fincher and Thornhill, 2012), the individualism/collectivism dimension of culture (Murray and Schaller, 2010; Fincher et al., 2008) or ethnic and religion diversity (Cashdan, 2001; Fincher and Thornhill, 2008).[8]

According to this literature and the so-called "parasite stress theory of sociality", infectious diseases constitute a major source of morbidity and mortality along human history and hence human communities developed behavioral adaptations to defend against parasites (see Fincher and Thronhill, 2012; 2014). Behavioral adaptations (also described as *behavioral immune system*) basically consist of a number of ancestrally adaptive attitudes, social values and norms towards out-group and in-group members, unwillingness to interact with out-group people and prejudice against people perceived as unhealthy, contaminated or unclean.[9] In other words, human communities developed a set of cultural norms and social values aiming to be protected by infectious diseases (see e.g., Fincher and Thornhill, 2014 for more details on this).[10] Since contemporary cultural values are affected -at least in part- by the *behavioral immune system* developed by local communities over the centuries, we expect regions that are located in more lethal disease environments to be characterized by more collectivistic norms (i.e. in-group favoritism, stronger family ties etc) even nowadays.

Focusing on issues related to ethnic fragmentation, Cashdan (2001) suggests that ethnic diversity is shaped chiefly by environmental factors and more precisely by: (i) unpredictable climate and (ii) high pathogen prevalence. Concerning the issue of pathogen prevalence, Cashdan (2001) employs a composite index of pathogen stress -that takes into account the worldwide distribution of leishmanias, trypanosomes, malaria, schistosomes, filariae, spirochetes and leprosy- and provides empirical evidence in favor of a positive relationship between pathogen stress (i.e., infectious diseases) and ethnic diversity. More precisely the empirical analysis suggests that regions characterized by heavier pathogen stress are crowed by relatively more ethnic groups (that is they exhibit stronger ethnic diversity). This is because in these regions, human communities developed heavier habitat diversity and a more assortative sociality as a mean of protection against infectious diseases, which as times goes

[8] For instance, Mc Neill (1974) suggested that castes in India initially formed, at least in part as a cultural response to local parasite stress. In other words, castes formed as a system of social values and behavior toward out-group and in-group members and prejudice against people perceived as unhealthy, contaminated or unclean.

[9] To be more precise, human communities developed chiefly two types of adaptation against parasites stress. The first one is the *classical immune system* that consists of biochemical, cellular and tissue-based adaptation, whereas the second one is the *behavioral immune system,* which is comprised by a set of cultural norms and social values aiming to protect the community from infectious diseases (see e.g., Fincher and Thornhill, 2012; 2014)

[10] A small but growing literature in economics builds on pathogen prevalence theory (see e.g., Gorodnichenko and Roland, 2017; Grundler and Kollner, 2020; Kammas et al., 2017; Nikolaev et al., 2017; Olsson and Paik, 2016) and employs epidemiological variables to instrument culture. The basic advantage of relying on instruments which are not economic in nature is that they ensure a sufficient source of exogenous variation for culture and related social values.

by transformed to ethnic diversity. Similarly, Fincher and Thornhill (2008) provide evidence of a positive and significant relationship between infectious diseases and religion diversity.[11]

3.1.2. Empirical specification

To explore the effect of ethnic diversity on trade union density, we employ the following basic econometric specification:

$$Y_i = \alpha_0 + \alpha_1 Ethnic_i + \beta X_i + \varepsilon_i \quad (1)$$

where *i* indexes for countries, Y_i is trade union density, $Ethnic_i$ is the measure of ethnic diversity, X_i is a vector of control variables and ε_i denotes the error term. The vector X_i includes commonly used controls such as GDP per capita, shares of the informal and agricultural sectors in the economy, employment in agriculture, unemployment, population, income inequality, democratic institutions and a set of dummy variables for continents, major religions and legal origins.

As we have already mentioned, on a battery of empirical estimations we instrument $Ethnic_i$ on a set of epidemiological data that have been linked empirically to ethnic and religious diversity (see e.g., Cashdan, 2001; Fincher and Thornhill, 2008).

3.2. Migrants from different countries within Europe

The second part of the analysis explores the effect of ethnic diversity on the decision of a worker to participate in a trade union. In particular, our analysis builds on the *epidemiological* empirical strategy suggested by Fernandez (2008, 2011) and employs a set of 6880 migrants from 116 countries of origin, residing in 32 European countries. It is established that higher levels of ethnic diversity in the country of origin are associated with lower levels of participation in trade unions.

3.2.1. Data and Empirical Strategy

The main objective of this part of the analysis is to investigate the effect of ethnic diversity on the decision of a worker to participate in a trade union. However, the decision of a worker to participate in a trade union inevitably reflects many country characteristics such as the level of economic development, the economic and the political institutions of the country etc. To separate the decision of each individual from the general economic and institutional setting, our analysis follows the empirical strategy suggested by Fernandez (2008, 2011) and places the spotlight on a set of 6,880 first generation migrants from 116 countries of origin, residing in 32 European countries.

This approach allows us to account for a number of individual characteristics (such as age, gender, education, type of employment etc) but most importantly to introduce residence country fixed effects, which are

[11] Other empirical studies that build upon the insights of biogeography in order to investigate the origins of ethnic and cultural fragmentation in contemporary national populations include Ashraf and Galor (2013), Ahlerup and Olsson (2012) and Michalopoulos (2012).

able to account for a large number of characteristics of the residence country (such as economic and political institutions, culture etc). More precisely, we proceed by estimating the following empirical specification for immigrants' decision to participate in a trade union:

$$Y_i = \alpha_0 + \alpha_1 Ethnic_b + \beta X_i + \theta_r + \varepsilon_i \quad (2)$$

where i indexes for individuals, Y_i is a dummy variable that equals one whenever an immigrant worker is a member of a trade union in the country of residence and zero otherwise, $Ethnic_b$ is the measure of ethnic diversity in the birth country of the immigrant, X_i is a vector of individual characteristics, θ_r is a fixed effect for residence country r of immigrant i and ε_i denotes the error term. We adjust standard errors to allow for clustering of the error term by birth country. The vector of individual characteristics X_i includes demographic characteristics such as age and gender, education, type of employment, sector of employment, political preferences etc. The residence country fixed effect θ_r captures the effect of economic and political institutions as well as potential cultural influences of the residence country.

We employ individual data from the 5th and 6th rounds of the European Social Survey (ESS), a cross-sectional survey conducted in a number of European countries. The analysis reports attitudes of *N=6880* first generation migrants, who originate from 116 countries all over the world and have migrated in 32 European countries. Data on ethnic fractionalization are associated with the country of origin of the migrant and vary solely at the birth country level. Apparently, these data are identical to those employed in the cross-country analysis.

Respondents are given the statement "Are you or have ever been a member of trade union or similar organization?" and the respondents answer by "Yes" or "No". The ESS database also provides information about the age of the respondent, the gender, the highest level of education achieved, the type and the sector of employment, the religion denomination in which he/she belongs and the political preferences of the respondent. In order to control for a variety of potentially confounding factors we employ two alternative set of controls. The first one is identical to the set of explanatory variables employed by Schnabel and Wagner (2007) whereas the second is that used by Kirmanoğlu and Başlevent (2012), both of which investigate the decision to participate in trade unions.

4. Empirical Results

In this section, we examine whether the data implies a relationship between ethnic diversity and trade union density. First, we present empirical results using a core set of explanatory variables [Tables 1a and 1b]. Then we inquire into the robustness of our empirical findings by employing extended sets of controls and alternative diversity and trade union measures [Tables 2, 3 and 4]. Finally, we investigate whether the above-mentioned relationship survives when our analysis relies on micro data [Tables 5 and 6].

4.1 The effect of ethnic diversity on trade union density: Baseline results

Table 1a presents OLS and 2SLS estimates of Equation (1), when we employ the *Trade Union Density* measure developed by ILO as dependent variable and the ethnic diversity measure compiled by Alesina et al. (2003) as key explanatory variable. More precisely, columns (1)-(3) present the simple OLS estimates and columns (4)-(12) the 2SLS estimates where *Ethnic (Alesina)* is instrumented on the: (i) *combined parasite stress* measure developed by Fincher and Thornhill (2012) [see columns (4)-(6)], (ii) *pathogen prevalence of infectious diseases* measure developed by Fincher and Thornhill (2008) [see columns (7)-(9)] and (iii) *non-zoo parasite stress* index compiled by Fincher and Thornhill (2012) [see columns (10)-(12)]. In most empirical specifications we control for continental fixed effects whereas in Columns (3), (6), (9) and (12) we also control for the level of economic development by employing the log of gdp per capita in 2005 (taken from the *World Bank Development Indicators*).

[Table 1a, here]

We see that *Ethnic (Alesina)* enters with a negative, highly significant and large coefficient in all alternative OLS estimates as well as in the second stage of 2SLS estimates. Specifically, a one-standard deviation difference in ethnic diversity between two countries implies 16.5% lower trade union density in the country with the higher diversity, indicating a quantitatively important effect (see column (6)). Obtained empirical findings are in accordance with the predictions of the theory (see e.g., Alesina and la Ferrara, 2000; Lipset and Marks, 2000) highlighting the negative relationship between ethnic diversity and trade unions' density. Moreover, focusing on the empirical results of the first stage, our analysis is in line with Cashdan (2001) suggesting that countries characterized by heavier parasite stress present higher levels of ethnic diversity.

[Table 1b, here]

Table 1b replicates the estimation of Equation (1) by employing identical empirical specifications to those presented in Table 1a and employing the ethnic diversity measure developed by Fearon (2003) as a key explanatory variable. Specifically, just as in Table 1a, columns (1)-(3) present the OLS estimates, whereas columns (4)-(12) include the results from the 2SLS estimates when *Ethnic (Fearon)* is instrumented on parasite stress and pathogen prevalence data. As can be seen, in all alternative specifications *Ethnic (Fearon)* bears a negative and highly significant coefficient, which is in line with the economic argument suggesting that ethnic diversity is negatively correlated with trade unions. Moreover, if ethnic fractionalization is higher by one-standard deviation in a country relative to another, the trade union density of the former is predicted to be 16% lower than the latter *(*see column (6)*)*, in line with the results using *Ethnic (Alesina)*. In addition, placing the spotlight on the first stage, we observe that obtained empirical findings are in accordance with the "parasite stress theory of values and sociality" suggesting that countries located in more fatal disease environment present stronger ethnic divisions.

4.2 Robustness

In turn, we inquire into the robustness of the obtained empirical results by employing extended sets of controls as well as alternative diversity and trade union measures. To this end, Table 2 presents 2SLS estimates of Equation (1) using an extended set of explanatory variables that allows to account for a battery of potential confounding factors. More precisely, in columns (1) and (6) we control for a number of structural economic characteristics -such as the share of the informal sector in the economy, the share of the agricultural sector and total employment in agriculture -that may influence the participation of workers in trade unions. In columns (2) and (7), we further extend our set of covariates by accounting in addition for unemployment, economic inequality and total population whereas in columns (3) and (8) we also account for political institutions. Finally, in columns (4) and (9) we control for major religions and in columns (5) and (10) for country legal origins.

[Table 2, here]

Table 2 presents the empirical results obtained in the second stage when in the first stage we employ as instrument the *combined parasite stress* measure developed by Fincher and Thornhill (2012).[12] We see that both *Ethnic (Alesina)* and *Ethnic (Fearon)* enter with negative significant and large coefficients in all alternative specifications highlighting the negative relationship between ethnic diversity and the participation in trade unions. Specifically, countries which differ by a one-standard deviation in terms of ethnic diversity are predicted to exhibit 8.4% (*Ethnic (Alesina)*) and 7.2% (*Ethnic (Fearon)*) difference in terms of union density in the most complete specification (columns (5) and (10)). These are smaller than the baseline estimates (around 16%), but at the same time more reasonable and still quantitatively important indicating differences of around one-third of the mean union density. As far as the rest of the covariates are concerned, the share of agriculture bears a negative and significant coefficient indicating that economies characterized by larger agricultural sectors present lower trade union density. Similarly, economic inequality enters with a negative and significant coefficient in most specifications. This puzzling -at a first glance- empirical finding could be explained by taking into account that low-skilled workers working with limited duration contracts (or no contract at all) usually abstain from participating in trade unions (see Kirmanoğlu and Başlevent (2012) for more details on this). Therefore countries characterized by more heterogeneous labor force (i.e. stronger divisions between low-skilled/ high-skilled workers) and hence higher income inequality are expected to exhibit lower trade union density.[13]

[Table 3, here]

[12] We note that obtained empirical findings remain qualitatively intact when we employ as instruments the *pathogen prevalence* as well as the *non-zoo parasite stress* measures. Results are available upon request.

[13] The empirical results of the first stage remain qualitatively identical to those presented in Tables 1a and 1b. All empirical findings are available upon request.

In Table 3 we inquire into the robustness of our empirical results by employing alternative ethnic and religion diversity measures. More precisely, Table 3 replicates the empirical estimations of Table 2 when we employ as key explanatory variables: (i) ethnic diversity measure developed by Montalvo and Reynal-Querol (2005) [denoted as *Ethnic (Montalvo)*] (columns (1)-(3)), (ii) the total number of distinct ethnic groups in a country's population, as developed by Fearon (2003) [denoted as *Number of ethnic groups(Fearon)*] (columns (4)-(6)), the number of major religions and ethno-religions per country compiled by Barrett et al., (2001) *World Christian Encyclopaedia* [denoted as *Religion Diversity (Barrett)*] (columns (7)-(9)) and (iv) the religion fractionalization developed by Montalvo and Reynal-Querol (2005) [denoted as *Religion Fractionalization (Montalvo)*] (columns (10)-(12)). As before, Table 3 presents the empirical results obtained in the second stage when in the first stage we employ as instrument the *combined parasite stress* measure developed by Fincher and Thornhill (2012). As can be seen, all four alternative ethnic and religious fractionalization measures bear negative and significant coefficients highlighting the negative relationship between ethnic (or religious) diversity and the participation in trade unions and providing evidence that our empirical findings are not sensitive to the ethnic (or religious) diversity measure employed. Concerning the rest of the covariates, empirical results remain qualitatively identical to those presented in Table 2.

[Table 4, here]

Finally, in Table 4 we inquire into the robustness of our findings by replicating the empirical estimations of Table 2 using as dependent variable the trade union density measure developed by Botero et., al (2004) [denoted as *Trade Union (Botero)*]. Employing this measure implies a significant drop in the size of our sample that now equals to maximum 64 observations. As before, we present empirical findings of the second stage when we employ as instrument for ethnic diversity in the first stage the *combined parasite stress* measure compiled by Fincher and Thornhill (2012). As can be verified, once again both *Ethnic (Alesina)* and *Ethnic (Fearon)* enter with negative and highly significant coefficients in all alternative specifications. The predicted differences in terms of trade union density are in line with those using *Trade Union Density* developed by the ILO (13.5% and 10.7% for *Ethnic (Alesina)* and *Ethnic (Fearon)* respectively). These empirical findings provide further evidence in favor of a negative relationship between ethnic fractionalization and trade union density.

4.3 The effect of ethnic diversity in the birth country on the decision to participate in trade unions

In Table 5 we investigate the effect of ethnic diversity on the decision to participate in trade unions. More precisely, we proceed by presenting Probit estimates of Equation (2), using data for a sample of *N=6880* first generation migrants in Europe who originate from 116 different countries. Individual-level data are obtained from the European Social Survey (ESS), whereas the data on ethnic diversity are identical to those employed in the cross-country analysis and vary solely at the birth country (of the migrant) level. We follow the *epidemiological approach* suggested by Fernandez (2008, 2011) and employed by several scholars (see e.g., Luttmer and Singhal (2011); Galor and Ozak, 2016) which allows us to introduce residence country fixed effects and hence to control

for a battery of confounding factors that vary at the residence country level (such as economic and political institutions or culture). Finally, we account for a number of individual characteristics (such as age, gender, level of education, type of employment etc) by employing a set of covariates identical to those employed by Schnabel and Wagner (2007).

[Table 5, here]

Specifically, column (1) presents Probit estimates of Equation (2) when the set of covariates include solely the ethnic diversity at the birth country of the migrant [denoted as *Ethnic Alesina (birth country)*] and residence country fixed effects. In turn, in column (2) the set of controls is extended so as to include a battery of individual characteristics, whereas in column (3) we also account for the level of development by introducing gdp per capita at the birth country of the migrant [denoted as *gdp per capita (birth country)*]. As can seen in all three alternative specifications *Ethnic Alesina (birth country)* enters with a negative and highly significant coefficient highlighting the negative effect of increased ethnic diversity in the country of origin on the decision of a worker to participate in trade unions. In columns (4)-(6) we replicate the empirical estimations of columns (1)-(3) by employing as key explanatory variable the ethnic diversity measure compiled by Fearon (2003) at the birth country of the migrant [denoted as *Ethnic Fearon (birth country)*]. Once again, *Ethnic Fearon (birth country)* bears a negative and significant coefficient providing further evidence of a negative relationship between ethnic diversity in the country of origin and the decision of a worker to participate in trade unions.

As far as the rest of the covariates are concerned, our empirical findings are in line with previous empirical studies (see e.g., Schnabel and Wagner, 2007; Kirmanoğlu and Başlevent, 2012). Specifically, *Age* exerts a non-linear, inverse U-shaped effect on the decision to participate in trade unions, whereas the level of education [denoted as *Education Low/High*], the establishment size of the firm and the political preferences of the worker [denoted as *Left-Right Scale*] appear to be significant factors which influence the participation decision. Finally, the type of employment of the father bears a negative and significant coefficient indicating that workers coming from families, in which the father was self-employed tend to participate less in trade unions.

[Table 6, here]

In Table 6 we inquire into the robustness of our obtained empirical results by replicating the empirical estimations of Table 5 using a set of explanatory variables identical to that employed by Kirmanoğlu and Başlevent (2012). We see that once again *Ethnic Alesina (birth country)* and *Ethnic Fearon (birth country)* enter with negative and significant coefficients providing further evidence of a negative relationship between ethnic diversity in the country of origin and the decision of a worker to participate in trade unions. Concerning the rest of the controls, our empirical findings remain qualitatively identical to those presented in Table 5 and they are also in line with previous empirical studies examining similar issues (see e.g., Kirmanoğlu and Başlevent, 2012).

5. Concluding Remarks

This paper seeks to investigate the hypothesis that workers participate less in trade unions in more ethnically fragmented societies. The empirical analysis takes place in two layers exploiting exogenous variations in ethnic diversity across: (a) countries and (b) migrants from different countries within Europe.

More precisely, in the first layer the analysis proceeds by placing the spotlight on a dataset of 91 -developed and developing- countries and investigating the effect of ethnic and religious diversity on trade union density. To address the usual endogeneity and omitted variable concerns -driven by the fact that both ethnic diversity and trade union density may be endogenous to economic and political institutions- our analysis employs a set of innovative instruments derived from biogeography, which have been linked empirically to ethnic and religious diversity (see e.g., Cashdan, 2001; Fincher and Thornhill, 2008).

In turn, our analysis investigates the above-mentioned hypothesis by using the European Social Survey (ESS) dataset and in particular a sample of first-generation migrants residing in ESS countries. Consistent with the prediction of the theory (see e.g., Alesina and La Ferrara, 2000; Lipset and Marks, 2000) both layers of the empirical analysis provide evidence of a strong, negative and highly significant relationship between ethnic diversity and the decision of the workers to participate in trade unions. Obtained empirical findings remain highly robust across a battery of alternative empirical specifications and estimation techniques.

Table 1a: The effect of ethnic diversity on trade union density

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Second Stage, Dependent variable: Trade Union Density												
		OLS		**2SLS (Combined Parasite Stress)**			**2SLS (Pathogen Prevalence)**			**2SLS (Non Zoo Parasite Stress)**		
Ethnic (Alesina)	-0.324***	-0.285***	-0.226***	-0.586***	-0.649***	-0.646***	-0.602***	-0.688***	-0.740***	-0.564***	-0.593***	-0.569***
	(0.070)	(0.074)	(0.081)	(0.093)	(0.124)	(0.167)	(0.103)	(0.139)	(0.235)	(0.093)	(0.118)	(0.173)
GDP per capita			0.036			0.001			-0.010			0.005
			(0.022)			(0.028)			(0.034)			(0.028)
						First Stage: the instrumented variable is Ethnic (Alesina)						
Combined Parasite Stress				0.062***	0.058***	0.070***						
				(0.005)	(0.007)	(0.009)						
Pathogen Prevalence							0.025***	0.021***	0.022***			
							(0.002)	(0.003)	(0.003)			
Non Zoo Parasite Stress										0.090***	0.078***	0.085***
										(0.008)	(0. 009)	(0.011)
F-stat (1st Stage)				123.8	60.02	56.79	95.38	44.31	32.24	123.10	61.68	53.30
Continent dummies		✓	✓		✓	✓		✓	✓		✓	✓
Observations	91	91	91	90	90	90	91	91	91	91	91	91
R^2	0.174	0.265	0.287									

Notes: The table presents OLS and 2SLS estimates of Equation (1), when we employ the *Trade Union Density* measure developed by ILO as dependent variable and the ethnic diversity measure compiled by Alesina et al., (2003) as key explanatory variable. Columns (1)-(3) present the simple OLS estimates and columns (4)-(12) the 2SLS estimates when *Ethnic (Alesina)* is instrumented on the: (i) *combined parasite stress* measure developed by Fincher and Thornhill (2012) [columns (4)-(6)], (ii) *pathogen prevalence of infectious diseases* measure developed by Fincher and Thornhill (2008) [see columns (7)-(9)] and (iii) *non-zoo parasite stress* index compiled by Fincher and Thornhill (2012) [see columns (10)-(12)]. The set of continent dummies includes a fixed effect for Sub-Saharan Africa, Middle East and North Africa, South Asia, East Asia and Pacific, North America and Latin America .Columns (3),(6),(9) and (12) also account for the level of economic development by employing the log of gdp per capita in 2005 (taken from *World Bank Development Indicators*). The F-stat is the F statistic for the explanatory power of the excluded instrument in first stage regressions. Robust standard errors are in parentheses. *** (**, *) denotes statistical significance at the 1 (5, 10) percent level.

Table 1b: The effect of ethnic diversity on trade union density

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Second Stage, Dependent variable: Trade Union Density												
		OLS		**2SLS (Combined Parasite Stress)**			**2SLS (Pathogen Prevalence)**			**2SLS (Non Zoo Parasite Stress)**		
Ethnic (Fearon)	-0.260***	-0.203***	-0.163**	-0.501***	-0.636***	-0.609***	-0.561***	-0.736***	-0.766***	-0.499***	-0.582***	-0.538***
	(0.064)	(0.074)	(0.078)	(0.097)	(0.156)	(0.185)	(0.118)	(0.199)	(0.291)	(0.101)	(0.147)	(0.184)
GDP per capita			0.035			0.005			-0.005			0.010
			(0.023)			(0.029)			(0.037)			(0.029)
				First Stage: the instrumented variable is Ethnic (Fearon)								
Combined Parasite Stress				0.064***	0.056***	0.073***						
				(0.006)	(0.009)	(0.010)						
Pathogen Prevalence							0.025***	0.018***	0.020***			
							(0.002)	(0.003)	(0.004)			
Non Zoo Parasite Stress										0.091***	0.074***	0.088***
										(0.009)	(0.011)	(0.012)
F-stat (1st Stage)				108.2	37.72	47.50	78.49	25.00	20.36	102.3	42.46	50.13
Continent dummies		✓	✓		✓	✓		✓	✓		✓	✓
Observations	81	81	81	81	81	81	81	81	81	81	81	81
R^2	0.126	0.208	0.229									

Notes: The table presents OLS and 2SLS estimates of Equation (1), when we employ the *Trade Union Density* measure developed by ILO as dependent variable and the ethnic diversity measure compiled by Fearon (2003) as key explanatory variable. Columns (1)-(3) present the simple OLS estimates and columns (4)-(12) the 2SLS estimates when *Ethnic (Fearon)* is instrumented on the: (i) *combined parasite stress* measure developed by Fincher and Thornhill (2012) [columns (4)-(6)], (ii) *pathogen prevalence of infectious diseases* measure developed by Fincher and Thornhill (2008) [see columns (7)-(9)] and (iii) *non-zoo parasite stress* index compiled by Fincher and Thornhill (2012) [see columns (10)-(12)]. The set of continent dummies includes fixed effects for Sub-Saharan Africa, Middle East and North Africa, South Asia, East Asia and Pacific, North America and Latin America. Columns (3),(6),(9) and (12) also account for the level of economic development by employing the log of gdp per capita in 2005 (taken from *World Bank Development Indicators*). The F-stat is the F statistic for the explanatory power of the excluded instrument in first stage regressions. Robust standard errors are in parentheses. *** (**, *) denotes statistical significance at the 1 (5, 10) percent level.

Table 2: The effect of ethnic diversity on trade union density: Full set of controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Second Stage, Dependent variable: Trade Union Density										
					2SLS (Instrument: Combined Parasite Stress)					
Ethnic (Alesina)	-0.604***	-0.385***	-0.405***	-0.301**	-0.330**					
	(0.184)	(0.137)	(0.141)	(0.127)	(0.134)					
Ethnic (Fearon)						-0.505***	-0.366***	-0.365***	-0.246**	-0.272**
						(0.170)	(0.135)	(0.132)	(0.111)	(0.117)
GDP per capita	0.035	0.004	-0.012	-0.040	-0.051	0.029	-0.008	0.002	-0.016	-0.027
	(0.056)	(0.043)	(0.047)	(0.049)	(0.048)	(0.056)	(0.050)	(0.051)	(0.049)	(0.049)
GDP Informal	0.001	0.003	0.002	0.004	0.004	0.001	0.001	0.001	0.003	0.003
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Employment in Agriculture	0.003*	0.002*	0.002	0.000	0.000	0.002	0.002	0.001	0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Agriculture Share	-0.438	-1.070***	-1.135***	-1.277***	-1.395***	-0.530	-1.070**	-1.077**	-1.109***	-1.241***
	(0.431)	(0.410)	(0.408)	(0.337)	(0.338)	(0.417)	(0.436)	(0.433)	(0.371)	(0.371)
Unemployment		-0.000	-0.000	-0.001	0.000		-0.002	-0.002	-0.003	-0.001
		(0.003)	(0.003)	(0.003)	(0.003)		(0.004)	(0.004)	(0.003)	(0.003)
Population		-0.052*	-0.026	-0.002	0.002		-0.005	-0.006	0.027	0.026
		(0.031)	(0.033)	(0.029)	(0.030)		(0.037)	(0.036)	(0.032)	(0.033)
Inequality		-0.010***	-0.009***	-0.008***	-0.009***		-0.008***	-0.008**	-0.006**	-0.007**
		(0.003)	(0.003)	(0.003)	(0.003)		(0.003)	(0.003)	(0.003)	(0.003)
Democracy			-0.003	-0.004	-0.006			-0.006	-0.007	-0.010
			(0.007)	(0.006)	(0.006)			(0.008)	(0.007)	(0.007)
Continent dummies	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Religion				✓	✓				✓	✓
Legal Origins					✓					✓
Observations	80	78	75	75	75	73	71	71	71	71
F-stat (1st Stage)	30.59	37.25	32.96	29.99	29.82	33.78	34.68	32.62	30.39	34.66

Notes: The table presents 2SLS estimates of Equation (1), when we employ the *Trade Union Density* measure developed by ILO as dependent variable and the ethnic diversity measure compiled by Alesina et al., (2003) [columns (1)-(5)] and Fearon, (2003) [columns (6)-(10)] as key explanatory variables. More precisely, the Table presents empirical results obtained in the second stage when in the first stage we employ as instrument for ethnic diversity the *combined parasite stress* measure developed by Fincher and Thornhill (2012). The set of continent dummies includes fixed effects for Sub-Saharan Africa, Middle East and North Africa, South Asia, East Asia and Pacific, North America and Latin America. The set of legal origins dummies includes affixed effect for British legal origin, German origin, Scandinavian origin and French origin. Finally, the set of major religions controls for the share of Protestant, Muslim, Catholic and other religions in the population. The F-stat is the F statistic for the explanatory power of the excluded instrument in first stage regressions. Robust standard errors are in parentheses. *** (**, *) denotes statistical significance at the 1 (5, 10) percent level.

Table 3: Robustness [Alternative Ethnic and Religion Diversity Measures]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Second Stage, Dependent variable: Trade Union Density												
						2SLS (Instrument: Combined Parasite Stress)						
Ethnic (Montalvo)	-0.441***	-0.372**	-0.335**									
	(0.148)	(0.170)	(0.168)									
Number of Ethnic Groups (Fearon)				-0.462**	-0.236**	-0.174**						
				(0.188)	(0.094)	(0.085)						
Number of Religions (Barret)							-0.122***	-0.105***	-0.087**			
							(0.036)	(0.039)	(0.037)			
Religion Fractionalization (Montalvo)										-0.776**	-0.603**	-0.491**
										(0.366)	(0.267)	(0.218)
GDP per capita	0.020	-0.041	-0.066	0.014	-0.012	-0.036	0.011	0.003	-0.036	0.021	0.008	-0.043
	(0.026)	(0.069)	(0.069)	(0.034)	(0.068)	(0.064)	(0.025)	(0.056)	(0.051)	(0.032)	(0.053)	(0.052)
Controls												
Continent dummies	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vector X_i		✓	✓		✓	✓		✓	✓		✓	✓
Religion			✓			✓			✓			✓
Legal Origins			✓			✓			✓			✓
Observations	80	67	67	81	71	71	89	74	74	80	67	67
F-stat (1st Stage)	36.18	14.85	11.31	10.53	13.33	11.43	57.85	35.84	32.89	8.138	10.08	13.43

Notes: The table presents 2SLS estimates of Equation (1), when we employ the *Trade Union Density* measure developed by ILO as dependent variable and ethnic fractionalization measure developed by Montalvo and Reynal-Querol (2005) [columns (1)-(3)], the total number of distinct ethnic groups developed by Fearon, (2003) [columns (4)-(6)], the number of major religions and ethno-religions per country compiled by Barrett et al., (2001) [columns (7)-(9)] and the religion fractionalization developed by Montalvo and Reynal-Querol (2005) [columns (10)-(12)] as key explanatory variables. More precisely, the Table presents empirical results obtained in the second stage when in the first stage we employ as instrument for ethnic diversity the *combined parasite stress* measure developed by Fincher and Thornhill (2012). The set of continent dummies includes fixed effects for Sub-Saharan Africa, Middle East and North Africa, South Asia, East Asia and Pacific, North America and Latin America. The set of legal origins dummies includes fixed effects for British legal origin, German origin, Scandinavian origin and French origin. Finally, the set of major religions controls for the share of Protestant, Muslim, Catholic and other religions in the population. Vector Xi includes the standard set of controls employed in Table 2 (i.e. *GDP Informal, Employment in Agriculture, Agriculture Share, Unemployment, Population, Inequality, Democracy*). The F-stat is the F statistic for the explanatory power of the excluded instrument in first stage regressions. Robust standard errors are in parentheses. *** (**, *) denotes statistical significance at the 1 (5, 10) percent level.

Table 4: Robustness [Alternative Dependent Variable]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Second Stage, Dependent variable: Trade Union Density [Botero et al., 2004]										
					2SLS (Instrument: Combined Parasite Stress)					
Ethnic (Alesina)	-0.967***	-0.610***	-0.609***	-0.469**	-0.528**					
	(0.360)	(0.212)	(0.211)	(0.192)	(0.212)					
Ethnic (Fearon)						-0.745***	-0.481***	-0.481***	-0.370***	-0.407***
						(0.249)	(0.166)	(0.165)	(0.142)	(0.153)
GDP per capita	0.011	0.038	0.036	0.024	-0.020	0.057	0.064	0.065	0.050	0.015
	(0.097)	(0.084)	(0.088)	(0.079)	(0.089)	(0.077)	(0.080)	(0.086)	(0.079)	(0.084)
GDP Informal	0.008	0.013***	0.013***	0.015***	0.015***	0.006	0.011**	0.011**	0.013***	0.012***
	(0.006)	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)	(0.003)
Employment in Agriculture	0.000	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.002	0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Agriculture Share	-0.544	-1.240	-1.233	-1.307	-1.741**	-0.545	-1.100	-1.104	-1.084	-1.519**
	(0.821)	(0.890)	(0.875)	(0.887)	(0.842)	(0.649)	(0.823)	(0.810)	(0.839)	(0.770)
Unemployment		-0.008	-0.008	-0.006	-0.004		-0.011	-0.011	-0.008	-0.007
		(0.008)	(0.007)	(0.006)	(0.008)		(0.008)	(0.008)	(0.007)	(0.007)
Population		-0.178***	-0.179***	-0.150***	-0.136***		-0.145***	-0.145***	-0.119***	-0.108***
		(0.045)	(0.045)	(0.043)	(0.044)		(0.039)	(0.039)	(0.039)	(0.038)
Inequality		-0.006	-0.006	-0.005	-0.008*		-0.005	-0.005	-0.004	-0.007
		(0.004)	(0.005)	(0.004)	(0.005)		(0.005)	(0.005)	(0.005)	(0.005)
Democracy			0.001	-0.006	-0.007			-0.000	-0.007	-0.008
			(0.010)	(0.009)	(0.010)			(0.012)	(0.010)	(0.010)
Continent dummies	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Religion				✓	✓				✓	✓
Legal Origins					✓					✓
Observations	64	61	61	61	61	62	59	59	59	59
F-stat (1st Stage)	13.63	22.21	20.87	20.12	19.90	23.69	30.59	28.72	27.61	25.98

Notes: The table presents 2SLS estimates of Equation (1), when we employ the *Trade Union Density* measure developed by Botero et al., (2004) as dependent variable and the ethnic diversity measure compiled by Alesina et al., (2003) [columns (1)-(5)] and Fearon, (2003) [columns (6)-(10)] as key explanatory variables. More precisely, the Table presents empirical results obtained in the second stage when in the first stage we employ as instrument for ethnic diversity the *combined parasite stress* measure developed by Fincher and Thornhill (2012). The set of continent dummies includes fixed effects for Sub-Saharan Africa, Middle East and North Africa, South Asia, East Asia and Pacific, North America and Latin America. The set of legal origin dummies includes fixed effects for British legal origin, German origin, Scandinavian origin and French origin. Finally, the set of major religions controls for the share of Protestant, Muslim, Catholic and other religions in the population. The F-stat is the F statistic for the explanatory power of the excluded instrument in first stage regressions. Robust standard errors are in parentheses. *** (**, *) denotes statistical significance at the 1 (5, 10) percent level.

Table 5: Factors influencing the probability of union membership [Schnabel and Wagner (2007) set of controls]

	(1)	(2)	(3)	(4)	(5)	(6)
Ethnic Alesina (birth country)	-0.614***	-0.368**	-0.396**			
	(0.157)	(0.167)	(0.194)			
Ethnic Fearon (birth country)				-0.535***	-0.334**	-0.366**
				(0.136)	(0.150)	(0.173)
Gdp per capita (birth country)			-0.001			-0.001
			(0.003)			(0.003)
Age		0.080***	0.081***		0.080***	0.080***
		(0.010)	(0.010)		(0.010)	(0.010)
Age square		-0.057***	-0.057***		-0.056***	-0.056***
		(0.009)	(0.009)		(0.009)	(0.009)
Gender		-0.049	-0.049		-0.028	-0.027
		(0.061)	(0.061)		(0.058)	(0.058)
Education Low		-0.139***	-0.140***		-0.118**	-0.119**
		(0.053)	(0.053)		(0.049)	(0.048)
Education High		0.005	0.006		0.017	0.018
		(0.057)	(0.057)		(0.058)	(0.058)
Part Time worker		-0.037	-0.036		-0.046	-0.046
		(0.059)	(0.059)		(0.059)	(0.060)
Establishment Size (<10)		0.237***	0.236***		0.234***	0.233***
		(0.083)	(0.082)		(0.084)	(0.084)
Establishment Size (25> and <99)		0.437***	0.437***		0.437***	0.437***
		(0.073)	(0.073)		(0.074)	(0.074)
Establishment Size (100> and <499)		0.579***	0.579***		0.577***	0.577***
		(0.074)	(0.074)		(0.073)	(0.073)
Establishment Size (>500)		0.585***	0.585***		0.587***	0.587***
		(0.071)	(0.071)		(0.070)	(0.070)
Left-Right Scale		-0.042***	-0.042***		-0.041***	-0.041***
		(0.014)	(0.014)		(0.014)	(0.014)
Member of Religion		0.032	0.030		0.040	0.037
		(0.059)	(0.061)		(0.060)	(0.062)
Father Education Low		0.041	0.041		0.049	0.050
		(0.053)	(0.053)		(0.054)	(0.054)
Mother Education Low		0.071	0.068		0.053	0.050
		(0.054)	(0.051)		(0.053)	(0.049)
Father Self Employed		-0.107***	-0.107***		-0.106***	-0.106***
		(0.037)	(0.037)		(0.039)	(0.039)
ESS round	0.003	0.027	0.026	0.005	0.030	0.029
	(0.030)	(0.046)	(0.046)	(0.031)	(0.046)	(0.046)
Residence country dummies (32)	✓	✓	✓	✓	✓	✓
Observations	6,880	4,022	4,022	6,777	3,955	3,955

Notes: Robust standard errors adjusted for clustering by birth countries are in parentheses. The dependent variable is ever union membership. Column (1) presents Probit estimates of Equation (2) when the set of covariates include solely the ethnic diversity at the birth country of the migrant [denoted as *Ethnic Alesina (birth country)*] and residence country fixed effects. In turn, in column (2) the set of controls is extended so as to include a battery of individual characteristics whereas in column (3) we also account for the level of development by introducing gdp per capita at the birth country of the migrant [denoted as *gdp per capita (birth country)*]. In columns (4)-(6) we replicate the empirical estimations of columns (1)-(3) by employing as key explanatory variable the ethnic diversity measure compiled by Fearon (2003) in the birth country of the migrant [denoted as *Ethnic Fearon (birth country)*]. Individual data are obtained by the 5th and 6th rounds of European Social Survey (ESS).*** (**, *) denotes statistical significance at the 1 (5, 10) percent level.

Table 6: Factors influencing the probability of union membership [Kirmanoğlu and Başlevent (2012) set of controls]

	(1)	(2)	(3)	(4)	(5)	(6)
Ethnic Alesina (birth country)	-0.614***	-0.508***	-0.597***			
	(0.157)	(0.154)	(0.162)			
Ethnic Fearon (birth country)				-0.535***	-0.453***	-0.523***
				(0.136)	(0.153)	(0.158)
GDP per capita (birth country)			-0.003			-0.003
			(0.003)			(0.003)
Age		0.084***	0.084***		0.084***	0.084***
		(0.009)	(0.009)		(0.009)	(0.009)
Age square		-0.061***	-0.061***		-0.061***	-0.061***
		(0.008)	(0.008)		(0.009)	(0.009)
Gender		-0.194***	-0.192***		-0.174***	-0.173***
		(0.068)	(0.067)		(0.065)	(0.065)
Education Low		-0.141***	-0.143***		-0.127***	-0.130***
		(0.050)	(0.049)		(0.049)	(0.048)
Education High		-0.064	-0.061		-0.056	-0.053
		(0.059)	(0.059)		(0.060)	(0.060)
Left-Right Scale		-0.034***	-0.033***		-0.031***	-0.031***
		(0.010)	(0.010)		(0.010)	(0.010)
Religiosity		0.008	0.007		0.008	0.007
		(0.009)	(0.008)		(0.009)	(0.009)
Type of Employment						
Central Government		0.366*	0.365*		0.386*	0.385*
		(0.214)	(0.214)		(0.219)	(0.219)
Public Sector		0.476*	0.478*		0.504**	0.506**
		(0.251)	(0.251)		(0.254)	(0.254)
State owned enterprise		0.267	0.267		0.280	0.280
		(0.290)	(0.289)		(0.297)	(0.297)
Private Sector		-0.090	-0.091		-0.061	-0.062
		(0.268)	(0.268)		(0.272)	(0.272)
Self Employed		-0.574**	-0.572**		-0.541*	-0.539*
		(0.277)	(0.277)		(0.276)	(0.276)
Establishment Size (<10)		0.090	0.089		0.090	0.088
		(0.090)	(0.090)		(0.091)	(0.091)
Establishment Size (25> and <99)		0.198**	0.198**		0.193**	0.193**
		(0.081)	(0.081)		(0.082)	(0.082)
Establishment Size (100> and <499)		0.395***	0.394***		0.397***	0.396***
		(0.068)	(0.068)		(0.068)	(0.067)
Establishment Size (>500)		0.337***	0.336***		0.344***	0.345***
		(0.069)	(0.070)		(0.070)	(0.070)
Sector of Employment						
Mining		0.336	0.336		0.277	0.276
		(0.269)	(0.268)		(0.275)	(0.273)
Manufacturing		0.177***	0.178***		0.170***	0.171***
		(0.055)	(0.055)		(0.055)	(0.055)
Energy		-0.166	-0.166		-0.152	-0.150
		(0.174)	(0.173)		(0.174)	(0.174)

Construction		0.184	0.186		0.147	0.148
		(0.127)	(0.127)		(0.125)	(0.124)
Trade		0.060	0.061		0.049	0.050
		(0.074)	(0.074)		(0.074)	(0.074)
Transportation		0.242**	0.246**		0.233**	0.236**
		(0.105)	(0.105)		(0.105)	(0.105)
Communication		-0.299*	-0.294*		-0.319*	-0.315*
		(0.163)	(0.163)		(0.168)	(0.168)
Finance		-0.044	-0.041		-0.036	-0.033
		(0.133)	(0.133)		(0.132)	(0.132)
Public Administration		-0.021	-0.019		-0.005	-0.003
		(0.118)	(0.118)		(0.120)	(0.120)
Education		0.073	0.079		0.081	0.087
		(0.088)	(0.088)		(0.089)	(0.089)
Health		0.212**	0.213**		0.202**	0.202**
		(0.098)	(0.099)		(0.098)	(0.098)
Other		-0.051	-0.048		-0.077	-0.076
		(0.116)	(0.116)		(0.118)	(0.117)
Unlimited duration Contract		0.313***	0.313***		0.317***	0.316***
		(0.096)	(0.096)		(0.097)	(0.097)
Limited duration contract		0.111	0.108		0.103	0.100
		(0.093)	(0.093)		(0.093)	(0.093)
ESS round	0.003	-0.008	-0.007	0.005	-0.008	-0.008
	(0.030)	(0.045)	(0.045)	(0.031)	(0.046)	(0.046)
Residence country dummies (32)	✓	✓	✓	✓	✓	✓
Observations	6,880	4,324	4,323	6,777	4,258	4,257

Notes: Robust standard errors adjusted for clustering by birth countries are in parentheses. The dependent variable is ever union membership. Column (1) presents Probit estimates of Equation (2) when the set of covariates include solely the ethnic diversity in the birth country of the migrant [denoted as *Ethnic Alesina (birth country)*] and residence country fixed effects. In turn, in column (2) the set of controls is extended so as to include a battery of individual characteristics whereas in column (3) we also account for the level of development by introducing gdp per capita at the birth country of the migrant [denoted as *gdp per capita (birth country)*]. In columns (4)-(6) we replicate the empirical estimations of columns (1)-(3) by employing as key explanatory variable the ethnic diversity measure compiled by Fearon (2003) in the birth country of the migrant [denoted as *Ethnic Fearon (birth country)*]. Individual data are obtained by the 5th and 6th rounds of European Social Survey (ESS).*** (**, *) denotes statistical significance at the 1 (5, 10) percent level.

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